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American Journal of Public Health
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THE IMPROVEMENT OF CANCER MORTALITY STATISTICS IN THE UNITED STATES.

CURTIS E. LAKEMAN,
Executive Secretary, American Society for the Control of Cancer.

Read before the Vital Statistics Section of the American Public Health Association, Rochester, N. Y., September 9, 1915.

AT A meeting of the Executive Council of the American Society for the Control of Cancer held on February 7, 1914, Mr. Frederick L. Hoffman, Chairman of the Committee on Statistics, introduced the following resolution which was unanimously adopted:

"*Resolved*, That the Executive Committee of the American Society for the Control of Cancer respectfully suggests to the Director of the United States Census, that the Division of Vital Statistics be instructed to publish hereafter, in the annual volume on mortality statistics, a more detailed statement of the deaths from cancer and other malignant tumors, as reported for the registration area of the United States and in accordance with the details as given in the second revision of the Manual of the International List of Causes of Death, pages 63–66 inclusive."

This suggestion received favorable consideration and was perhaps the initial impulse in the project for a special report on the cancer mortality of 1914, which was soon afterward ordered and planned by the former Director of the Census, Hon. William H. Harris, and is now being completed under his successor, Hon. Sam. L. Rogers. In an announcement of the proposed plan the Director stated that the seven titles, numbers 39 to 45 inclusive, under which deaths from cancer and other malignant tumors are grouped and reported in the International List of Causes of Death, would be subdivided for the calendar year 1914 into twenty-nine titles of particular organs and parts of the body affected, and the figures published accordingly in a special monograph. The detailed list of titles adopted for this purpose was given as follows:

39—Cancer and Other Malignant Tumors of the Buccal Cavity
- 39a—Cancer of the lip
- 39b—Cancer of the tongue
- 39c—Cancer of the mouth
- 39d—Cancer of the jaw
- 39x—Others

40—Cancer and Other Malignant Tumors of the Stomach, Liver
- 40a—Cancer of the pharynx
- 40b—Cancer of the esophagus
- 40c—Cancer of the stomach
- 40d—Cancer of the liver and gall bladder

41—Cancer and Other Malignant Tumors of the Peritoneum, Intestines, Rectum
- 41a—Cancer of the mesentery and peritoneum
- 41b—Cancer of the intestines (except rectum)
- 41c—Cancer of the rectum and anus
- 41x—Others

42—Cancer and Other Malignant Tumors of the Female Genital Organs
- 42a—Cancer of the ovary and fallopian tubes
- 42b—Cancer of the uterus
- 42c—Cancer of the vagina and vulva
- 42x—Others

43—Cancer and Other Malignant Tumors of the Breast

44—Cancer and Other Malignant Tumors of the Skin

45—Cancer and Other Malignant Tumors of Other Organs or of Organs not Specified
- 45a—Cancer of the larynx
- 45b—Cancer of the lung and pleura
- 45c—Cancer of the pancreas
- 45d—Cancer of the kidneys and suprarenals
- 45e—Cancer of the prostate
- 45f—Cancer of the bladder
- 45g—Cancer of the brain
- 45h—Cancer of the bones (except jaw)
- 45k—Cancer of the testes
- 45x—Others

After seeking the advice of leading American students of the cancer problem the Census Bureau began the collection of data for the special report by sending a query letter to thousands of physicians who had during 1914 certified cancer as a cause of death. This letter stated that the Bureau proposed to publish two sets of statistics covering the subject of deaths from cancer and other malignant tumors, (1) statistics of deaths in which the diagnoses were based on clinical findings, and (2) statistics of deaths in cases where the diagnoses were confirmed by autopsies or where surgical operations had been performed. The practitioner was accordingly requested to complete the record of the case on the transcript with reference to the character of the diagnosis, and to the exact seat of the disease. Over 35,000 of these query letters were sent out, and 60 to 70 per cent. of replies were received. An incidental result of this work soon appeared in the extent to which full details were given on the 1915 certificates and transcripts, although the special inquiry did not apply to deaths subsequent to December 31, 1914.

As the returns began to accumulate the Census Bureau prepared instructions for the assignment of terms used on the certificates to the new titles, and for editing the completed transcripts in accordance with the proposed plan of compilation. On February 17, 1915, the Director submitted to a conference of cancer students, a tentative plan of classification according to certainty or uncertainty of diagnosis. This conference included representatives of the American Society for the Control of Cancer, the American Association for Cancer Research, the George Crocker Special Research Fund

of Columbia University, the Harvard Cancer Commission, and the Barnard Free Skin and Cancer Hospital of St. Louis. In a letter transmitting the conclusions of this committee to the Director of the Census on March 8, 1915, the instructions for editing the transcripts were for the most part approved, the principal exceptions being as follows:

(1) That all diagnoses of inaccessible cancer based on clinical findings alone should be referred to the "uncertain" class regardless of any strength of assertion by the physician that the diagnosis was correct.

(2) That in general the term "reasonably certain" be substituted for the term "certain," on the ground that only microscopic examination can bring certainty to a diagnosis.

(3) For this reason it was suggested that the returns for microscopic findings be separately stated. (This, however, has not proved feasible.)

Thereupon the Division of Vital Statistics prepared tentative drafts of five tables for the proposed report and submitted these to an advisory conference held in New York on May 27, 1915, consisting of the representatives of the organizations already named and several well-known statisticians. After extended discussion, four of the tables were approved with certain modifications calculated to reduce the volume of clerical labor and printing. The fifth table, relating to the occupational phase, was recommended to be omitted entirely, owing to the unsatisfactory nature of the returns likely at present to be had in this field.

As agreed upon, Table I will show deaths from all forms of cancer according to certainty of diagnosis and by sex and quinquennial age groups after 35 for the registration area, the registration states (divided into urban and rural), registration cities in other states and all registration cities, provided that at least 100 deaths occurred during the census year in the particular area to be published. Figures for white and colored will be shown separately for such counties and towns as have a colored population of 10,000 or at least 10 per cent. of the total.

Table II will present deaths from cancer according to the seat of the disease, accuracy of diagnosis, and sex, for the registration area and all the usual subdivisions. Thirty-four columns are provided to cover the totals and subdivisions of the seven main titles 39–45.

Table III is the site and age table, showing cancer deaths by exact seat of disease, sex, color and nativity in quinquennial age groups for the registration states exclusive of North Carolina.

Table IV will show cancer deaths (all forms) by conjugal condition, sex, color and nativity in quinquennial age groups over 35 for the registration states exclusive of North Carolina.

As thus planned the special report is rapidly taking shape and may be expected to appear early in 1916. The amount of additional labor thereby thrown upon the Division of Vital Statistics, however, has been great and possibly those interested in cancer statistics will have to share the responsibility for the delayed publica-

tion of the regular annual report for 1914. It has been found necessary in preparing the cancer returns for tabulation to punch each cancer card in duplicate, adding the requisite code symbols for the exact site of the disease, for certainty or uncertainty of diagnosis, surgical intervention, autopsy, clinical findings, etc. Fortunately, the codification of this additional information on the cards can be continued for subsequent years without undue strain on the resources of the federal office. This means that a vast body of detailed information in regard to cancer in the United States registration area will be stored away each year in the form of punched cards ready for tabulation whenever the demand shall justify the additional labor and expense of publication.

It is evident from the foregoing review that the officials of the Census Bureau are entitled to the sincere congratulations of scientific students of the cancer problem the world over for their zeal in planning and carrying out this notable contribution to the statistical investigation of the chief problem of medical biology. It should be recorded that the project, as it took shape in the Census Bureau, went far beyond what was in mind when the Cancer Society offered its resolution of February, 1914. In justification of this laborious and expensive undertaking and to substantiate an appeal for coöperation in continuing the work thus begun, a few of the reasons why the detailed registration and publication of cancer mortality is necessary and desirable may be suggested.

In the first place it is essential to bear in mind the importance of the statistical method in the study of the ancient and continuing problem of the etiology of cancer. Observations of human subjects under varying racial, geographic, topographic, and climatic conditions, as well as studies of apparently analogous diseases in plants and animals have already brought out important facts bearing on the nature and causes of the various forms of malignant disease. The value of statistical inquiries, broadly defined, as a method to be relied upon side by side with experimental and clinical research, is illustrated by the work of the Imperial Cancer Research Fund. Upon the organization of this institution some twelve years ago, steps were immediately taken to procure comprehensive statistical observations and reports covering the entire British Empire. The wide diversity of countries, climates and races united under one governmental influence gave extraordinary facilities for such an undertaking and the results have in a large measure fulfilled the promise implied in the circumstances. Under the guidance of a statistical committee including such well known men as Dr. Arthur Newsholme, Dr. John Patten, Dr. T. H. Craig-Stevenson, Sir Arthur Whitelegge and others, the British institution has collected and published data which have notably advanced our knowledge of cancer. It is, perhaps, chiefly due to these studies that chronic irritation is now recognized as one of the chief conditioning factors in the occurrence of this disease. The investigations soon disclosed such facts

as that external cancer of the abdomen is common among natives of Kashmir who receive burns from the overheated charcoal warming-pan known as the kangri basket. In China the women eating cold rice at a second table escape the cancer of the esophagus which is common among men who eat the rice hot. In the Nile valley cancer of the foot is frequently observed among natives exposed to injury by thorns. Cattle in India exhibit cancer of the horn on that side to which by immemorial custom the harness is attached but not on the other horn. Many of these habits and customs among widely separated peoples have been aptly characterized as "natural experiments," in which human beings unintentionally subject themselves to observation under special conditions and, upon comparison with "control" races elsewhere, clearly disclose some of the causal factors in the occurrence of malignant disease (4). In a broad sense an example of the statistical method, these observations have given a stimulus to the investigation of old and new forms of irritation, resulting in a growing collection of data on the genesis of cancer under such conditions as scar tissue, injuries, burns, gallstones, hot food, excessive smoking, decayed teeth, exposure of the operator to burns from the X-ray machine, etc. Moreover conclusions resulting from such studies have in many cases been verified under artificial conditions in the laboratory, the combination of statistical and experimental methods constantly advancing the knowledge of this disease.

Another application of the statistical method which was at first considered promising is the special cancer census such as that taken in Germany on October 13, 1900, when an attempt was made to obtain information by circularizing physicians as to all existing cases of the disease. A close examination of results of the special census, particularly when tried afterward in Spain, Denmark and Sweden, has convinced many students that this method is practically useless. In the German census three times, and in the Spanish census twenty-five times as many deaths occurred as there were cases reported. In Spain 3 per cent., in Germany 55 per cent., in Sweden 97 per cent. and in Hungary 99 per cent. of the doctors replied, but in Sweden and Denmark at least one-half the replies were negative. In Hungary the return of the blank was made compulsory, whereupon three quarters of the doctors replied that there were no cases under their observation, doubtless the easiest way to avoid the penalty (5) (6). If, as in Baden, the cancer census was extended to cover a whole year, it needlessly overlapped the regular mortality report of the statistical office. Yet even in the Baden census the number of cases reported only slightly exceeded the number of deaths during the year instead of being triple or double that number as might reasonably be expected. Moreover, there was great danger of errors in tabulation and necessity for elaborate administrative provisions, when the time of the census was at all extended, to prevent duplication of reports by different doctors treating the same persons. These considerations led

the English students, at least, to reject the special census and to maintain that "the separation of statistics of cancer from those of the general mortality has not beneficially affected the results obtained (6)."

As providing a specific precedent for the work of the United States Census Bureau now in hand, it should therefore be noted that the English authorities have from the beginning maintained a policy of coöperative effort which strongly emphasizes the importance of studying and improving the regular national mortality statistics. The leading independent students and investigators in Great Britain have constantly avoided undertaking any investigations which would overlap with the duties of the Registrar General's office and have confined themselves to special inquiries "likely to advance the development of the national statistics or assist in their interpretation (3)." In particular, effort has been made to have the national statistical office publish more detailed data, especially figures showing the incidence of cancer in different parts of the body. For a long time it was pleaded that the expense would be out of proportion to the benefits which would follow from tabulating the several organs and sites of the body separately, and even after the policy had been agreed upon ten years ago, it could not be carried out until 1909. Beginning with that year, however, the reports of the Registrar General's office exhibit the figures of cancer analyzed in great detail according to organs and parts of the body. For several years the figures for the period since 1901 were published in such detail as to show the incidence on separate organs for each sex at different age periods, the increase reported for separate organs and for separate age periods as well as the curves of incidence characteristic for separate organs at separate age periods. In these first detailed reports a table was used which included 48 organs and parts for males and the same number with the appropriate changes for females. In 1911 when the Registrar General adopted the International List of Causes of Death, improved the methods of collecting statistics for England and Wales, and changed the form of his annual report, the special classification and study of cancer was continued under twenty-five sub-titles of titles 39–45 for males and twenty-six sub-titles for females (1). The list of organs and parts of the body now adopted by the Census Bureau is similar to that used by the Registrar General and it is to be anticipated that with the coöperation of state registration officials at least the foundation can be laid for studies of the American data as fruitful as those based on the English reports.

A few examples may be given to illustrate the advance in the knowledge of cancer which may reasonably be expected to result from more accurate and detailed statistics. Curves in which all cases of cancer are considered together give useful information, but the importance of the statistical approach to the problem is evident as soon as curves are made, not only for each sex at the several age periods but also for each organ or site affected. It

is elementary that upon the construction of such curves the greater frequency of cancer among women is at once seen to be due to cancer of the breast and uterus. When curves are completed for all the various organs for each sex at the several age periods, it appears that the rates of mortality for different organs at different ages are similar for the two sexes while the separate organs vary widely among themselves. Some organs show a curve which rises to a maximum only at the end of life, others a curve with the maximum earlier followed by a fall to the end of life, and still other organs exhibit two maxima at different age periods (4). Whatever the exact significance of these differences there can be no question of their importance and their full elucidation will undoubtedly throw further light on the nature of the disease. Even if statistics alone are unable to explain these phenomena they at least lead to the inference that more than one cause is at work in the etiology of cancer, which is in itself an important conclusion.

Another striking example is the comparison, as between the two sexes, of cancer incidence at various sites along the alimentary canal. From the English figures it has been possible to construct curves of relative frequency for the several parts of this system. These curves are found to cross at the stomach in both sexes. Above the stomach cancer is more common in the male, below it more common in the female. This has been found to hold true in both the national statistics and in special studies of hospital statistics made by the Imperial Cancer Research Fund. It is conceived that "this circumstance may not be without relation to the different habits of the two classes, the male irritating the upper half of the canal by smoking, alcohol, gulping his food, etc., more than the female who is, however, more prone to the chronic irritation of constipation" (4). Whatever the final deduction, it is clear that such studies, based on the detailed statistics of the national registration office, have already brought the world nearer to a scientific understanding of cancer.

A chief source of error and confusion in efforts to solve the cancer problem has been the tendency to regard it as a single definite disease. It is becoming increasingly apparent that the term cancer covers a large number of quite different diseases which exhibit differing histories and origin, run different courses and offer varying prospects of cure as they affect different organs and tissues. In other words modern pathology is apparently leading us ever further away from the possibility of explaining cancer as a single entity. A striking instance of this is found in the studies of Rous of the Rockefeller Institute on the transmission of chicken sarcoma by means of a filterable agent. The investigations disclosed three different forms of this disease and a separate agent for each form, which would not transmit either of the other forms. This fact in connection with a minute experimental study of one branch of the subject indicates how great may be the complexity of cancer in human beings. Progress in the experimental field is already more encouraging since cancer

students have recognized that they are dealing with a group of diseases, and these considerations indicate that similar importance must attach to the separate statistical study of the various forms of cancer in human beings, as they affect different organs and parts of the body.

In Frankfort-on-the-Main, Germany, the requirement of site analysis has been fulfilled and deaths from cancer have for years been classified in accordance with the parts of the body primarily affected. As a result, statistical treatises on cancer beginning with that of King and Newsholme in 1893 include extended reference to the Frankfort figures as a rare source of necessary data for the scientific study of the disease. The notable paper of Greenwood and Wood before the Royal Society of Medicine in 1914 to which Professor Willcox made reference before this section last year likewise emphasized the importance of detailed analysis. "We may add," say the authors in their concluding sections, "that although we have discussed here the problem which is of most popular interest, namely changes in the general rate of cancer mortality, we conceive that a more fruitful line of research is to analyze the local and secular changes in the rates of different sites in view of their largely independent variability (3)." This painstaking study depends for many of its conclusions upon an analysis of English and Swiss data for which, at the present time, there can be no comparison in the material available in this country. Their study of the Swiss figures so far as they go, cause the authors to think that "the scientific importance of comparison between the rates for all forms of cancer is less than the general public or even the medical profession as a whole suppose (3)." This belief led Greenwood and Wood to support the policy of the Registrar General of publishing separate tabulations of the site rates and to advocate the carrying of this tabulation even further than has yet been done, for instance, by the introduction of tables showing the site rates for some of the larger administrative divisions.

Turning to the much debated question of the reality of the recorded increase in cancer mortality and without taking sides on that classic issue, it is only necessary to point out that this problem with its important professional, scientific, and popular implications cannot be satisfactorily settled without analysis of the data by sex, age and site. Study of the English figures has shown that the increase is not uniform for the different parts of the body while for some organs, notably the uterus, an actual fall has been persistently evident since 1902. It was one of the fundamental tenets of the argument of King and Newsholme that the rates for inaccessible sites have markedly increased. Greenwood and Wood, in the paper already referred to, made a vigorous onslaught against this view, showing that on the contrary "the rate of increase is not uniformly greater in the case of inaccessible sites, that in particular the rates for the tongue in males and for the breast in females have advanced in a manner inconsistent with the general validity of the proposition as applied

to all forms of cancer, and that in consequence the attribution of the great increase in certain other inaccessible site rates, to improved diagnosis becomes arbitrary (3)." Without assuming to pass upon the merits of these subtle and weighty arguments it is sufficient for the purpose of this paper to inquire how far such refined and critical reasoning, based on the detailed tabulation of site rates, may be expected to proceed in America, if the war suspends progress in such studies in European countries. It is a welcome augury for the advance of statistical research in this field in America that the Census Bureau has undertaken to supply cancer data in such full detail.

Enough has been said to indicate the value of the statistical method in relation to the cancer problem, the importance of detailed statistics with regard to sex, age, race and site of attack of this complex and manifold disease, and the advantages of improving the national statistics as compared with the method of the special census. Those suggesting the changes in the reports of the Census Bureau do not overlook the wide range of information already obtainable (2). It should be remembered that the present annual reports, arranged according to the International List, include tables showing the following:

(1) Deaths from cancer (all forms and all ages) in the registration area, registration states, registration cities in other states and the urban and rural parts of registration states, according to color.

(2) Deaths from all forms of cancer and seven sub-titles in the registration area, its most important subdivisions and the cities and rural districts of each state, separated, where necessary, according to color.

(3) Deaths from all forms of cancer and the seven sub-titles in the registration area by sex and five-year age groups.

(4) Deaths from all forms of cancer and seven sub-titles in the registration area, all registration states, and each registration state, by ten-year age groups.

(5) Deaths from all forms of cancer in each city of 100,000 and over, by ten-year age groups.

(6) Death-rates in the registration area (seven titles).

(7) Death-rates (one title) in the registration area and sub-divisions according to color.

(8) Death-rates (seven titles) in cities and rural districts of each registration state.

These tables, so far as we are informed, will be continued without change in future reports. What students of cancer most desire to supplement this information is (1) greater detail in stating the number of cases by organs and parts affected, and (2) a higher degree of validity of the returns, that is to say, some effort to separate cases depending upon surgical and microscopical diagnosis from the more uncertain diagnoses depending on clinical findings alone. It is perhaps more than we can reasonably ask that all this laborious analysis should be made by the Census Bureau every year. It may well be, however, that as in the case of the English volumes,

the annual mortality reports will contain hereafter a more extended discussion in the prefatory pages in which special diseases are given topical treatment. Here there will be opportunity to publish the results of such detailed analysis of the new figures as may regularly be found feasible. It is to be hoped, though, that at periodic intervals, the Washington office may be able to repeat its project of publishing a special monograph on this disease.

At this point it may be appropriate to call attention to the advantages of even closer coöperation between the state registration offices and the Federal Bureau to the end that the registration of deaths, not only from cancer but from other diseases, may be further perfected. In particular it is hoped that a plan may be worked out for the more prompt and complete correction of death certificates. Doctor Wilbur has already suggested the appointment in each state registration office of an agent of the Census Bureau who would be authorized to send out uniform query letters on the stationery of the federal department. The advantages are obvious. Under the present plan it may be months before the transcript of a death certificate reaches Washington and is taken up in the course of business for the necessary querying and correction. By that time the details of the case may well have escaped the mind if not the records of the medical attendant. Under the proposed plan the necessary query letters can be sent to the physician within a comparatively short time of the death of the patient and the information promptly secured by the state official acting as an agent of the federal department. The expense of postage, which in many cases is considerable, would be spared to the state office which would then have to bear merely the cost of supervisory and clerical work. From the federal point of view the suggested procedure is justified by the fact that the information will be acquired primarily for federal purposes, namely, the improvement of the national mortality statistics. To the public at large the gain lies in the result that the completion and correction of death certificates would be carried out with a degree of uniformity and certainty throughout the country that will never be possible under varying administrative conditions in the many state jurisdictions.

Whether or not this plan is adopted, it is to be hoped that state registration officers will coöperate to maintain the improvements now secured in cancer registration by querying and by urging the regular reporting of full details on every certificate of death from cancer, particularly (1) the exact site of the disease, and (2) whether the diagnosis was based on clinical findings or was confirmed by autopsy, surgery, or microscopical examination. Wherever state officers already conduct much routine correspondence for the correction of death certificates the additional labor necessary to obtain this information would not appear to be prohibitive. There is appended as a suggestion a special inquiry letter suggested by Doctor Wilbur for this purpose.

It is also recommended that state and local statistical offices use the new detailed classification in tabulating and reporting deaths from cancer. Uniformity in this respect is desirable and the Census Bureau classification, as given at the beginning of this paper, seems well designed to meet the reasonable demands of cancer students while keeping within the limits of practicability.

A word of warning is necessary to prevent the possible suspension of still more detailed and valuable independent local studies. It is not meant to suggest that the improvement of national mortality statistics makes unnecessary any special inquiries analogous to epidemiological studies of other diseases. Such a study of cancer was made some years ago in New York by the State Institute for the Study of Malignant Disease at Buffalo in coöperation with the State Department of Health, and the example has been followed in some other states. These inquiries involve the asking of numerous questions as to parentage, occupation, case and family history, factors of irritation, diet, alcohol, tobacco, and similar details quite too numerous to be covered in a national query letter for the special purpose of improving the Census Bureau statistics. So far as they go these special studies are of definite value when properly done, and it would be regrettable if in any case they were to be discontinued under the impression that the national government had undertaken anything so extensive.

We feel sure that the members of this section as well as statisticians and students of the cancer problem, generally, will join in congratulating the Bureau of the Census on the execution of its notable contribution to the statistical study of malignant disease. Whatever coöperative arrangements may eventually be adopted, and whether or not the Federal Office is able to repeat its special report on cancer, it is clear that a definite gain has already been made. The Census Bureau will continue each year to punch its cards with reference to the site of the disease and the certainty of diagnosis. It is to be expected that state officers will do their part in one way or another to provide these details on their original cancer death certificates. By such coöperation it will be possible permanently to record and study the enormous body of American data on cancer mortality in a manner promising substantial scientific results. It will be gratifying if the present widespread interest in the cancer problem can be made the occasion of introducing any improvements in the administrative machinery of American vital statistics, and it can hardly fail to follow that this branch of public health work in our country will profit by the exceedingly careful study that has recently been given to the statistics of this particular disease, involving as it has, correspondence with over 30,000 American physicians upon whose coöperation and efficiency improvement in the registration of causes of death so largely depends.

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Department of Health of the State of New York.

SPECIAL INQUIRY ON DEATH FROM CANCER.

Dear Doctor:

Great interest is now being taken in the subject of cancer mortality and, as you are doubtless aware, a special investigation of the subject was lately undertaken by the United States Bureau of the Census at the instance of the American Society for the Control of Cancer. Among the inquiries were questions intended to elicit the amount and quality of the evidence available for the diagnosis of cases reported, this giving an important bearing upon the question of the actual or only apparent increase in mortality from this cause.

It is desired to continue the collection of this information for the current year, and I shall therefore greatly appreciate your assistance if you will kindly detach and return the slip below (by means of inclosed stamped envelope).

Yours very truly,

Hermann M. Biggs,
Commissioner.

By Cressy L. Wilbur,
Director, Division of Vital Statistics.

PLEASE DETACH AND RETURN STATEMENT BELOW.

Dist. No..... Reg. No.....
Name..... Date of death.....
Was diagnosis entirely clinical?.....
Operation?.....
Microscopic examination?.....
Postmortem findings?.....
Exact nature of neoplasm?.....
Part of body first affected?.....
Date.....191.. (Signed) ..... M. D.

DISCUSSION.

Richard C. Lappin,
Chief Statistician for Vital Statistics, Bureau of the Census.

At the request of the Executive Committee of the American Society for the Control of Cancer that the Bureau of the Census present statistics of cancer and other malignant tumors in greater detail than heretofore shown in the annual mortality reports, the Director of the Census on October 17, 1914, decided that the Bureau of the Census would publish a monograph on the deaths that occurred in the registration area during the calendar year 1914 reported as due to malignant growths.

As indicated in Mr. Lakeman's paper, the Bureau subdivided the seven International titles covering this subject so that statistics will be presented showing the mortality from cancer and other malignant tumors, classified according to location, under 29 separate headings. A member of the Society suggested that the two sets of statistics to be presented distinguish: (a) growths of which the malignant nature and existence were reasonably certain on the basis of autopsies, surgical operations, microscopical

examinations, or accessibility to observation by reason of exposed situations; (b) those of which identification as malignant tumors was uncertain, that is, internal cancers and other malignant growths diagnoses of which were based on clinical findings only.

The Director of the Census instructed the Division of Vital Statistics to estimate how great a percentage of the transcripts, as received by the Census, contained the desired information. It was estimated that at least 50,000 deaths would be reported during the year 1914 in the registration area as due to cancer and other malignant tumors. About 2,000 transcripts from several registration states were examined and it was found that in less than two per cent. of the cases was the fact of autopsy mentioned, and about nine per cent. of the transcripts contained the information that surgical operations had been performed; in practically no cases was it stated that the diagnosis was based on clinical findings. Using the number of deaths in 1913 as a criterion, it was estimated that about 8,500 deaths would be reported as due to cancer or malignant tumors of the buccal cavity, skin and breast, all so situated that no mistake would be probable in diagnosis and which, therefore, could be classified as of reasonably certain malignancy. Thus it appeared that no record of autopsy or surgical operation would be found in upward of 35,000 cases and that if the Bureau of the Census were to secure this information it would be necessary to communicate with each attending physician and ask whether the diagnosis was based on clinical findings, whether an autopsy had been held, or a surgical operation performed.

When the result of the examination of the transcripts was made known to the Director, he instructed the Division of Vital Statistics to prepare a form letter to be sent to physicians requesting the data described above. A copy of this letter follows:

Dear Doctor:

At the request of the American Society for the Control of Cancer the Bureau of the Census has decided to publish two sets of statistics covering the subject of deaths from cancer and other malignant tumors:

(a) Statistics of deaths in which the diagnoses were based on clinical findings.

(b) Statistics of deaths in which the diagnoses were confirmed by autopsies, or in which surgical operations were performed.

Will you kindly examine the accompanying transcript of a medical certificate of death, the original of which was made out by you, and note thereon whether the diagnosis was based on *Clinical Findings* or *Autopsy;* also whether there was *Surgical Intervention?* In either case the *Seat of the Disease* should also be stated. Any further data which you care to give may be written on the reverse side of the transcript.

The information will be treated as strictly confidential and used for statistical purposes only. I feel assured that your interest in advancing the scientific study of this subject will prompt you to aid the Bureau in this great work, the success of which is entirely dependent upon the coöperation of American physicians.

Prompt return of the information desired, by means of inclosed penalty envelope, which requires no postage, will be greatly appreciated, as we are now compiling these returns.

Very respectfully,

SAM. L. ROGERS,
Director.

About 37,000 of these circular letters were sent to the attending physicians and it is gratifying to be able to state that replies were received to more than 60 per cent. of them. In this connection we should not lose sight of the fact that in many cases the deaths occurred nine or ten months prior to the date of the receipt of the letters.

In behalf of the Bureau of the Census I wish to express here its appreciation of the interest and courtesy shown by thousands of American physicians in their replies. It was necessary in many cases to look up records which were months old; in others certificates had been signed by doctors who had answered calls in the absence of the regular medical attendants, but who either referred the Bureau to the latter or obtained from them the case histories. Many replies were accompanied by extracts from hospital records, nurses' charts, and even photographs of the growths. Deserving of very special thanks are two cases in which widows of deceased physicians sent extracts from case histories as found in the records of the physicians.

I agree fully with Mr. Lakeman's statement that if it were possible for the states to make such inquiries shortly after the deaths occurred a very much larger number of replies would be received.

It may be well to call attention here to the probability that one result of the Census inquiry will be the showing of an apparent increase in deaths from visible or accessible malignant growths. In editing the replies of physicians quite a number of cases have been noted of which the following is an example: The return is "cancer of the liver." The physician replying to the Census inquiry as to means of diagnosis states that, so far as the liver was concerned, the diagnosis was purely clinical but prior to this a cancer of the breast had been excised; or that the decedent had suffered for years with a malignant tumor of the rectum, the uterus, the axilla, the face, or of some other visible or accessible organ or member. Now, in classifying such a case the Bureau was confronted with this situation: (a) the existence of cancer was certain or "reasonably certain" in the visible or "accessible" organ or member; (b) the existence of cancer in the inaccessible organ was confirmed by clinical symptoms only; (c) the Executive Council of the American Society for the Control of Cancer in conjunction with representatives of other interested organizations and persons made the following recommendation to the Bureau of the Census: "That all diagnoses of inaccessible cancer based on clinical findings alone should be referred to the 'uncertain' class regardless of any strength of assertion by the physician that the diagnosis was correct."

Under these conditions it was decided to classify the death as one caused by cancer of the visible or accessible organ, it being deemed better to establish as nearly as possible the number of deaths in which it was "reasonably certain" that the cause was cancer, than to tabulate under the head of cancer *of any given organ* deaths which were declared by the Society to be *uncertain as to cause* owing to the fact that the diagnosis was based on clinical findings only. In former years, however, such a death, classified on the basis of the original unamended statement, would have been charged to cancer of the inaccessible organ, and it may be that the number of changes will be sufficient to influence the rate for title 44 (Cancer of the skin) and title 43 (Cancer of the breast).

$100,000 TO BE SPENT ON NEW YORK OR MASSACHUSETTS TOWN TO CONTROL TUBERCULOSIS.

Intense rivalry is being exhibited between towns in Massachusetts and New York in their endeavor to secure a fund of $100,000 which is to be expended during the next three years in an effort to control the spread of tuberculosis by the National Association for the Study and Prevention of Tuberculosis, as announced in a bulletin issued by that organization recently.

More than fifty different towns and villages, ranging in population from four to ten thousand inhabitants each, have been suggested as possible places for the experiment, and the State Charities Aid Association of New York, the Massachusetts Department of Health, and the local organizations in many of the towns are urging their claims with vigor. Among the towns which are being considered carefully are Canandaigua, Johnstown, Patchogue in New York; Framingham, Winchendon and Norwood in Massachusetts. The conditions of the experiment limit it to a town not to exceed five to ten thousand inhabitants.

The preliminary committee appointed to select the place consists of Dr. Edward R. Baldwin of Saranac Lake, President of the National Association for the Study and Prevention of Tuberculosis, as chairman; Dr. Lee K. Frankel and Mr. Homer Folks of New York, Dr. Arthur K. Stone of Boston, Dr. Stephen J. Maher of New Haven, Dr. William Charles White of Pittsburgh and Dr. Charles J. Hatfield, New York, executive secretary of the National Association for the Study and Prevention of Tuberculosis, as secretary. The committee has chosen Dr. Donald B. Armstrong of New York as executive officer of the experiment.

It is proposed by the committee as soon as the place is selected to discover with the aid of the local physicians, through careful medical examinations, every case of tuberculosis; every individual who has been exposed directly to the disease; and particularly all children up to sixteen who have had contact with a living case of tuberculosis during their lifetime. It is proposed that every known case of tuberculosis and every exposed case of whatever nature should be under some sort of supervision during the three-year period, either in the home, in an open air school, in a tuberculosis clinic, or in a hospital or sanatorium. In this way and by keeping in close contact with all new families and new babies born into the community the committee hopes to be able to prevent the spread of tuberculosis, to stop the development of any new cases in the community, and to determine the absolute and relative worth of the various methods usually employed in fighting tuberculosis.

ORGANIZING A STATE CAMPAIGN OF PUBLIC HEALTH EDUCATION.

C.-E. A. Winslow,

Professor of Public Health, Yale Medical School; Formerly Director, Division of Publicity and Education, New York State Department of Health, and Curator of Public Health, American Museum of Natural History, New York.

Read before a General Session of the American Public Health Association, Rochester, N. Y., September 8, 1915.

Read over this list of sub-titles indicating some of the features of public health education which are discussed by Professor Winslow in this article: "The Monthly Bulletin," Special Bulletin and Circulars," "The Newspapers as a Medium for Public Health Education," "Lecture Service," "Exhibits," and "Mobilizing the Community for Public Health."

IT IS unnecessary to argue before the American Public Health Association as to the importance of public health education as a factor in the prevention of preventable disease. The placing of this symposium upon the program shows what our officers think of the subject, and the size of the audience which has gathered to discuss it indicates that the members and guests of the Association are of the same mind as to its significance.

It was in the campaign against tuberculosis that the importance of reaching the individual citizen and teaching him about the conduct of his individual life was first definitely grasped. In the case of this disease it was quite clear that the most important of all measures were those which built up the vital resistance of the body and maintained the fighting edge which is so effective against this particular microbic enemy. Sanitary shops and tenements were needed; the sanitary care of sputum was needed; but, above all, healthy habits of individual living were essential. Hence the anti-tuberculosis movement became a great campaign of popular education. It was animated by a new idea, the idea of bringing hygienic knowledge right to the individual in his home or in his shop; and it developed a new machinery, a new system of organization for bringing about this end. The general anti-tuberculosis movement began in the United States in 1904, and since January, 1905, anti-tuberculosis organizations have increased from 24 to 1,228, sanatoria, hospitals and day camps from 115 to 527, dispensaries from 19 to 395. In doing this work the medical and sanitary experts, and particularly the social workers, not only pointed the way to a conquest of the great white plague, but set in motion forces which are revolutionizing the campaign for public health in every field. The same thing has happened more recently in the movement for the reduction of infant mortality. Budin began his conferences with nursing mothers, in 1894, but for ten years more public health officials were chiefly concerned with attempts to improve an artificial milk supply, while the central features of the problem, the child and the mother, were ignored. When the first American Conference for the Prevention of Infant Mortality was held at New Haven, in 1909, it was surprising to see how experience from every organization dealing with the problem had focused on a single point. Man after man said in effect that he had come to feel that the success of his station could be gauged, not by the quarts of milk distributed, but by the number of nursing mothers under instruction. The movement for the reduction of infant mortality became at that meeting, consciously and definitely, an educational one, and its prime task is today recognized, as clearly as in the case of tuberculosis, to be the task of carrying sanitary and hygienic knowledge into the individual home.

Education is indeed the keynote of the modern campaign for public health. Tuberculosis and infant mortality are preëminent among all the causes of preventable disease and death as the greatest scourges, from the abatement of which the largest results for humanity are to be attained. In each case the fight must be won, not merely by the construction of public work but by altering the daily conduct of the individual life. The same thing is true with regard to the spread of the acute contagia, the burden of venereal disease, the obscure ill effects of defective eyes and ears and teeth. In the campaign against the degenerative diseases of adult life, which progressive state and city health departments are now initiating, the education of the individual is our chief weapon. In every one of these cases the fight can be won only by spreading clear and definite knowledge of the ways in which disease is caused and the ways in which it may be prevented.

The general recognition of these facts is very recent and the technique of the art of public health education must be elaborated and perfected during the next few years. It has therefore seemed to me that in opening this discussion it might be of interest to review very briefly the attempts that have been made by the reorganized New York State Department of Health to work out the problems of public health education, in the hope that the lessons we have learned may be of value to those who are meeting the same difficulties in other communities.

Health Education in New York before 1914.

While the formal recognition of public education as a definite health department function is of recent date, we shall lose our perspective if we minimize the admirable pioneer efforts along health educational lines which have been made by some of the more enlightened health departments for many years. In New York State, for example, Commissioner Eugene H. Porter organized a Bureau of Instruction and Publication in 1905. Dr. Hills Cole became Director of a Division of Publicity and Education in 1906 with special charge of the editing of the monthly bulletin and the arrangement of the annual sanitary conference and sanitary institutes. Dr. H. D. Pease, then Director of the Laboratory of the Department, prepared an admirable traveling tuberculosis exhibit in 1907, and in conjunction with the State Charities Aid Association organized a fruitful exhibit and lecture campaign throughout the state in connection with this disease. Deputy Commissioner W. A. Howe in subsequent years organized an extensive lecture service with a large staff of special lecturers, serving the department when called upon, on a per diem basis. In 1910 a special exhibit dealing with sanitary engineering was prepared to be shown at the State Fair; and since the International Congress of Hygiene and Demography, the general exhibit work of the Department has been steadily developed by Mr. C. J. Storey, as Supervisor of Exhibits.

A foundation had thus been laid for all of the three fundamental phases of public health education, literature, lectures and exhibits, as early as 1907; and the work on the health exhibits was carried forward steadily and progressively, so as to become a real and important influence for good throughout the state. With the reorganization of the New York State Department of Health in January, 1914; with the creation by law of a Division of Publicity and Education as one of the nine fundamental divisions of the Department; with a larger appropriation than had before been available for the purpose; and with the energy, the enthusiasm, the courage and the wisdom of Commissioner Biggs to inspire and to guide; it became possible to develop plans for public health education upon a broader and more systematic scale.

The Monthly Bulletin.

The monthly bulletin of the Health Department is its official organ of communication with the public; and our first effort has been to convert it into an effective medium of health education for the more intelligent and interested classes of the community.

There is a popular writer for the *Saturday Evening Post* who has created for himself an ideal middle-western family from whose standpoint he criticizes everything he writes. The father is a clerk in a small store. The mother does her own housework. The elder sister is a teacher, the younger is in high school and the son drives a delivery wagon. Nothing goes into this author's "copy" unless he can see its

appeal to this family. Somewhat in the same way, I think, it is important for us to visualize, in everything we write, the public for which it is intended, and to study with much care the best possible way of getting a particular truth "over" to a particular audience.

The *Health News* is intended to reach the local health officers and physicians in small towns, the social workers, the school teachers and other educated citizens who are or may be interested in health problems. On the one hand, therefore, we do not use it for merely elementary exhortations as to the wellknown laws of health, but attempt so far as possible to present the latest information in regard to the progress of sanitary science and the local health problems of the state. On the other hand, long and technical discussions, of interest only to the highly trained expert, are banished from its columns and issued when necessary as special bulletins to a selected mailing list.

The name of the *Monthly Bulletin* we changed to *Health News*, and its somewhat cumbrous form to a convenient 6″ x 9″ size printed in large clear type. In each number some one subject is specially emphasized, such as Water Supply and Typhoid Fever, Smallpox and Vaccination, School Hygiene, Infant Welfare, Hot Weather Hygiene, Vacation Typhoid, Oral Hygiene, Cancer, Diseases of Adult Life, Farm Sanitation, Teeth, Tonsils and Adenoids, and the like. Each issue begins with a double-leaded editorial followed by two or three brief articles (500–1,000 words) by authorities upon the subject under discussion. The Department has been most fortunate in securing the generous coöperation of such men and women as President Eliot, Dr. T. M. Prudden, Dr. Simon Flexner, Prof. L. H. Bailey, Prof. G. N. Calkins, Dr. W. A. Evans, Dr. L. K. Frankel, Dr. W. H. Park, Dr. S. Josephine Baker, Dr. L. Emmett Holt, Dr. Theobald Smith, Prof. H. N. Ogden and Prof. W. T. Sedgwick in the preparation of these articles.

Significant departures in administrative procedure, national, state or local, and important epidemics are described as object lessons in the *News* and special attention is paid to news items in regard to current sanitary progress in the state. Each issue is illustrated with cartoons, diagrams or photographs, one of which is always displayed on the back cover.

Reports of divisions are reduced to very moderate dimensions, not only to save space but to make them more readable. Half a page that is read is much more valuable than five pages merely turned over, and I would commend to those who are specially interested Doctor Wadsworth's reports of the Division of Laboratories on the last page but one of each issue of the *Health News* as models of compact and effective presentation.

Tabulations of vital statistics are also reduced to a minimum. The monthly reports of many health departments waste a regrettable amount of good paper and ink in the presentation of tables full of blank spaces, or of figures too small to be of the least practical significance. On the other hand, I believe that a compact review of the general tendencies of the vital statistics for each month, in comparison with previous months and previous years, is one of the most important features, which we find is freely quoted in the public press. It is perhaps unnecessary to remark that abstracts of this and other matter of general interest should be given to the newspapers at the time of publication of each issue.

Following the lead of Virginia and other states we make the January number of the *News* a Health Almanac and this Almanac has perhaps received more favorable comment than any other feature of the work of the Division.

Eleven issues of the *Health News* were issued during 1914 with a total of 436 pages. The edition was increased to 35,000 copies and the *News* was mailed (except during the summer months) to each of the 15,000 school principals in the state as well as to the 1,200 health officers, the 8,000 physicians and a large special mailing list of persons interested. We feel that the public school is a vital strategic point in the health campaign and have striven to make the *News* of special value to teachers in their work. Each issue published during the school year has contained a special Health Lesson, a basis for a classroom talk to children on some important health topic, and we have received gratifying response from the teachers in regard to this plan. Owing to lack of funds it has been necessary during the present year to omit the school principals from our mailing list, except for the Almanac and a special Arbor Day number, but we hope this fall to reach the schools either through the Bulletin of the Department of

Education or by means of brief Health Lessons and special circulars prepared for that particular purpose.

Special Bulletins and Circulars.

In addition to the distribution of the *Health News*, it is of course the duty of the Department to issue special bulletins and circulars of information in regard to particular health problems. During the year 1914, five special bulletins and twenty-four circulars were issued by the Department.

The special bulletins deal with Infant Welfare Campaigns and Infant Welfare Stations, with the campaign for County Tuberculosis Hospitals, with Regulations for Cleansing and Disinfection During and After Attacks of Communicable Disease, and with the general aims and progress of the health movement in the state.

Ten of the twenty-four circulars relate to particular diseases, diphtheria, measles, scarlet fever, septic sore throat, smallpox and vaccination, sore eyes of new-born babies, tuberculosis, typhoid fever and whooping cough. Each circular contains specific directions for the patient, for the physician, and for the health officer, according to an excellent plan worked out by Dr. F. M. Meader, Director of the Division of Communicable Diseases.

Eight of the circulars deal with infant welfare, seven of them being brief, one-to-four-page leaflets on special problems of infant hygiene and the eighth a 28-page booklet on Your Baby —How to Keep It Well, prepared by Dr. H. L. K. Shaw, Director of the Division of Child Hygiene, which is sent automatically to the mother of every child in the state as soon as its birth is registered at Albany and is, we beljeve, accomplishing an incalculable amount of good. Efficient birth reporting, such as we are now securing in New York State, is of course essential for the success of this plan. The Infant Welfare leaflets have been translated into Italian and Polish. We should like to have these circulars and many of our other more elementary publications in Yiddish as well, so soon as funds permit.

The other six of our circulars deal with Farm Sanitation, with The Filthy Fly, The Teacher and Communicable Disease, The Conduct of an Isolation Period in the Home, Amusements for Convalescent Children and Industrial Tuberculosis (a folder intended for distribution through the medium of labor organizations).

The Newspaper as a Medium for Public Health Education.

In order to come in touch with a wider public than could possibly be reached by our official publications, we have asked the newspapers of the state to coöperate with us and have met with a ready and generous response. The public is more than eager for news of the campaign against preventable disease and the editor is ready and anxious to disseminate it—provided only that it be furnished in usable and effective form.

I am personally of the opinion that the director of a division of public health education in a large city or state should, where possible, be technically trained in public health science so that he may speak with individual authority to the medical profession as well as to the public. Such a director should, however, have at his right hand an expert in the art of publicity, preferably a man or woman with actual newspaper experience, for journalism has its technique just as sanitation has. In New York State we have been fortunate in securing for this important work the services of Mr. E. A. Moree of the State Charities Aid Association as Advisory Expert in Public Health Education; and Mr. Moree has had entire charge of all the special material prepared for the newspapers from time to time in regard to changes in department policy and to particular problems which we wished to bring forcibly before the public.

Our chief enterprise along the line of newspaper publicity has, however, been our weekly plate service which we call Health Hints. These Hints are about five hundred words in length and are sent out in plate or electrotype form to a special list of a little over three hundred daily and weekly papers throughout the state, and in proof form to the rest. The plates which are handled by the American Press Association are sent out every six weeks, a single plate containing six of the hints with release dates indicated on the proof and the total cost is $1.50 per plate or 25 cents a week for each newspaper.

The sort of topics covered are indicated by

the list of headlines for a year's Hints below, from June, 1914 to June, 1915:

Hot Weather Hygiene
Anti-typhoid Vaccination
Reporting Communicable Diseases
Isolation and Quarantine
Health on the Farm
Milk Supply and Disease
Safe Meat at Lower Cost
Modern Disinfection, Simple and Efficient
Time Limits for Infection
The Story of a Typhoid Carrier
Smallpox and Vaccination
Communicable Diseases of School Children
Black Death at New Orleans
The Health of Armies
Tuberculosis, The Universal Foe
County Hospitals and Taxes
Health Work Saves 700 Infant Lives
State Sanitary Rules for Dairy Farms
Food Values and Costs
Need for a Varied Diet
Victims of a Typhoid Well
Early Signs of Tuberculosis
Why Bad Air is Bad
Dust and Disease
Health Questions Answered
Typhoid Fever at a Church Dinner
Cancer—A Curable Disease
New Ways of Making Water Safe
People who Never Catch Cold
Diphtheria Conquered by Antitoxin
Getting Ahead of Measles
Little Mothers' Leagues
New State Law on Nuisances
4,000 People Saved
Season and Vitality
How to Prevent Pneumonia
Checking School Epidemics
Control of Whooping Cough
The Deadly Drinking Cup
Spring Clean-ups and Flies
Typhus Fever and its Cause
Arbor Day and Health
What Milk do You Drink?
Diseases of Adult Life
Alcohol the Common Foe
Flies or Babies?
Summer Care of Babies
Patriotism and Lockjaw
Starving Out the Enemy
The Messenger of Health
Keep Cool
Avoid Vacation Typhoid
Getting Rid of Mosquitoes
When the Baby is Sick
More Milk-borne Disease
State Laboratory Works for You

We confine ourselves quite closely to public health problems; for in a public service of this kind it would hardly be proper to deal with such purely medical questions as are treated, for example, by Dr. W. A. Evans in his admirable column on How to Keep Well in the *Chicago Tribune* and syndicated papers. As a rule two of the Hints out of each batch of six are illustrated. Each Hint runs across two columns with a uniform head bearing the state seal at the top above the headline and occupying about nine inches or 18 column-inches in length. The style is made extremely simple and popular, important words being printed in bold type; and I have constantly tried to keep in mind the advice of a wise and expert journalistic friend to "tell the gist of the story in the first paragraph; make the information specific; avoid a heavy dictatorial style; quote individuals and mention names whenever you can; avoid technical terms and subtle distinctions so far as possible."

If I may be permitted a personal confession, an unduly solemn and arbitrary manner in preparing popular health material is one of the most difficult things to avoid for a man of New England birth and training. I think I perceive signs of the same failing in much of our Eastern health literature. The Middle West, escaping from the Scylla of the pulpit, sometimes falls a victim to the Charybdis of the vaudeville stage; while much of the Southern literature, notably that of North Carolina and Virginia, strikes a very happy mean of cheerful and chatty, but not undignified instruction.

The newspapers to which our Hints are sent in plate form use them with a high degree of regularity, and we estimate that by this means we are reaching over a million readers a week. Individual responses are most gratifying. One country editor remarked in conversation that when he left out the Health Hint one week, three subscribers wrote and asked the reason, "which never happened before in my whole editorial experience."

Another editor writes:

"We wish to thank you for the much prized pleasure of noting the *Journal* in the preferred list for the health plate service which has rewarded your efforts so ably presented at the recent legislative session.

"We believe the good such publicity brings for the cause is far reaching, and is of such a nature that only time alone can show the result.

"We have been pleased to devote the space to such work and the plate service simplifies the work for the busy editor to the extent that the Department is insured of more productive results for their efforts for the public good.

"Again thanking you for past courtesies, and wishing you to know that the *Journal* is ever at your service."

A shoemaker in an upstate town told an official of the State Department of Education, "my little girl reads those Health Hints aloud to the whole family every week as religiously as her mother does the Bible."

I am personally of the opinion that the maintenance of a weekly plate health service is the most important thing a health department can do along educational lines, next to the issue of its monthly bulletin. In our own case I am sure that it has not only accomplished a real work of public health education but has contributed in large measure to the splendid support given to the Health Department by the newspapers of the state, at a time when legislative attacks seemed to endanger the successful continuance of our work.

Organizing a Lecture Service.

The old plan of lecture service under which the New York State Department worked was based on the occasional employment of special lecturers of whom a considerable number were attached to the Department to be called on when needed and paid so much a lecture when actually employed. There are several serious objections to such an arrangement. In the first place per diem employment of this sort is expensive. In the second place it is difficult to supervise a large number of part-time lecturers; and finally a plan of this sort offers rather special temptations to political influences.

With the reorganization of the State Department of Health and the creation of a corps of twenty district sanitary supervisors, it was possible to meet the needs for a public health lecture service in a more efficient manner. Lectures on general health topics are now assigned as a matter of routine to the sanitary supervisor of the district concerned, and the twenty supervisors deliver on the average about fifty lectures a month.

During the past winter we had also four special lecturers attached to the Division of Publicity and Education. Two of them, lecturers on oral hygiene and on diseases of the eye and ear, respectively, devoted themselves almost entirely to work in the public schools, while a third was appointed as a special lecturer to parochial schools, and the fourth was a woman physician who lectured on infant welfare and social hygiene. These four lecturers gave fifty to seventy-five lectures a month last winter. None of these special lecturers, except the one serving in the parochial schools, have been provided for by the legislature in its appropriations for 1915–1916. I am inclined to think that the lecture work in the schools might more properly be conducted by the Department of Education, rather than by the Department of Health; but a special lecturer on infant welfare and social hygiene can render very valuable service in talks to women's clubs and similar organizations.

Much of the lecture work called for in a large state like New York must necessarily be done by local health officers, physicians and other persons interested in the general cause. For the benefit of such persons, occasionally called upon to speak upon health topics, as well as for our own sanitary supervisors, we have prepared printed lecture syllabi of eight to twelve pages each on the War Against Tuberculosis, Health on the Farm, Clean Milk and Safe Milk, Man and the Microbe, and Famous Epidemics. For each of the first four of these lectures we have a set of from thirty to fifty lantern slides, which are loaned on request to health officers or others who may need them.

As a further aid in popularizing our health lectures we have prepared three motion picture films—Bringing It Home, the story of how circumstances, plus the state infant welfare exhibit at a county fair, brought home to a doubting capitalist the value of an infant welfare station; In His Father's Footsteps, in which

stern experience teaches a conservative farmer that the old ways do not pay; and a Messenger of Health, the story of a visiting nurse. The demand for these films by health officers and others shows that motion pictures can be of great service in a public health campaign. We have used them at a great many public meetings where our exhibit has been held. In some places the use of the motion picture houses was secured especially for this feature. In others, the films have been shown as part of the regular program in the theaters, and the fact that they were on exhibition advertised as a special feature.

We feel that the reels which we now have are perhaps only a nucleus for a library of educational films which could include popular films as well as technical ones which the agencies never handle.

It is not of course sufficient merely to be ready to arrange for giving lectures when they are called for. Here, as well as everywhere else, there is what corresponds to the manufacturing work of our business and what corresponds to the selling end.

In order to enlarge the demand for health lectures we have organized systematic campaigns among the women's clubs, the granges and the labor unions, and the same thing might be done with chambers of commerce, rotary clubs and other organizations. The plan in each case is essentially the same. First of all, an endorsement is obtained from the state body which represents all the various local clubs. Then a letter is sent out to each local organization with the endorsement of, or in the name of, the state federation, offering the service of the Health Department lecturers. When the lecture is actually given the attempt is usually made to have a Public Health Committee appointed by the organization, since such committees, while not spontaneously active, furnish machinery useful in future health campaigns.

Public Health Exhibits.

The distribution of literature and the organization of a lecture system must be supplemented by a more striking and vivid appeal to the eye; and the exhibit now forms a part of any well-developed public health campaign.

The New York State Department of Health, as pointed out above, has for nearly ten years been a pioneer in this field; and a skilled and experienced Supervisor of Exhibits, Mr. Charles J. Storey, was appointed by the Department under the previous administration.

During the past eighteen months we have prepared three new travelling exhibits dealing respectively with Child Welfare, Rural Hygiene and the Hygiene of Adult Life. Each of these exhibits is made up of about eighteen large panels (six feet by three feet) illustrated by hand-colored photographs, pictures and diagrams and mounted by an ingenious system of supports devised by Mr. Storey, which are solid and yet may be easily taken apart for transportation.

The Child Welfare Exhibit, of which we have three duplicate sets, includes eighteen panels illustrating the importance of birth registration, disinfection of the eyes of new-born babies, breast-feeding, fresh air, cleanliness, fly protection and vaccination, showing how milk should be pasteurized and cared for, and how the baby should be washed and fed, and emphasizing the value of the infant welfare station as a center for the education of the mother. A special feature of the exhibit, which has proved of the greatest value, is a fully equipped infant welfare station in charge of a trained nurse as demonstrator.

The seventeen panels in the Rural Hygiene Exhibit, of which we have also three sets, illustrate the sanitation of the home and the importance of cool fresh air; the proper way to dispose of household wastes and the control of insect carriers of disease; the methods by which safe water and milk can be ensured, and the precautions which should be taken to check the spread of tuberculosis and other communicable diseases on the farm. The panels in this exhibit are supplemented by models of a group of sanitary farm buildings, and of a dangerous and a well-protected well.

The nineteen panels in the Adult Hygiene Exhibit deal with the increasing death-rate at ages over 45 and its contributing causes, with the evils of alcoholism and venereal diseases, and with the fundamental hygiene of the diet, of fresh air, exercise and rest, with the control of cancer and the importance of systematic medical examination for the detection of degenerative diseases in time to check their development.

During the spring and early summer of 1914,

the Child Welfare Exhibits were shown in 59 different communities throughout the state, while in August and September both Child Welfare and Rural Hygiene Exhibits were sent on circuit to the county fairs, being shown at fifty-three county fairs, as well as at the State Fair at Syracuse.

The general plan of arranging for an exhibit is as follows: First of all, preliminary arrangements as to date, exhibition hall and lecture room are made by correspondence with the local health officer and other persons especially interested, and as soon as this has been done a letter is sent out from Albany to the local physicians and clergymen asking for their coöperation. About two weeks ahead of the date set for the opening of the exhibit, an advance publicity man visits the town, armed with illustrated material for the local press. He makes sure that the arrangements for the hall are satisfactory and plans with the school authorities for the children to visit the exhibit and to attend the meetings for the organization of Little Mothers' Leagues. The exhibit is actually installed by one of the Department nurses with the assistance of a laborer, and the nurse remains in constant charge while it is open and conducts the meetings for the school children, while evening meetings for the public are addressed by the local health officer, the sanitary supervisor of the district, and speakers from the Health Department staff at Albany.

This type of intensive exhibit campaign has its own distinct and individual advantages. It is particularly well suited for rousing public opinion as to some particular local sanitary need; and our Child Welfare Exhibit has been followed throughout the state by a trail of enthusiastic and constructive infant welfare work. It has seemed to us, however, that such a program of exhibit work might well be supplemented by some plan for reaching a larger number of communities in a given time and at a less cost. This implies the reproduction of Exhibit panels by some mechanical process in a form convenient for shipment and display, and after much thought and some experimenting we have hit upon a practical plan for doing this.

The National Process of New York has prepared for us during the past summer 50 sets of reproductions of our Adult Hygiene panels, printed on 12-ply card, 28 inches by 22 inches, which seem to meet all the essential needs of the situation. These cards, with the illustrations hand-colored, can be obtained after the first plates are made for fifty cents apiece and perhaps later on even for less, and we trust that they may be of service to health workers outside New York State as well as in our Department. Our plan is to send these panels to various communities in the state and have them displayed by the health officer or by any organization interested, in the library or high school or some other prominent location where they can remain for several weeks.

There is one further step which it seems to me should be taken to make our exhibit work more effective. In connection with all our exhibits, literature upon health topics is of course supplied for general distribution. I should like, however, to have cuts of the exhibit panels themselves prepared and printed with an explanatory text in the form of a special circular, so that the visitor whose interest has been roused by the sight of the large panels might carry home with him the same lessons to be studied and assimilated at his leisure. Plans are already under way for the preparation of such a circular on the Hygiene of Adult Life, to be used in connection with the exhibit devoted to that special subject.

Mobilizing the Community for Public Health.

There are two distinct reasons why the enlistment and organization of a wide public is vital to the success of our health campaign. In the first place the individual citizen must be taught the principles of hygiene and sanitation for his own use and application. The reserves are always at the front in the campaign against disease, and the battles are in the nature of a guerilla warfare in which each one must be taught to do his part. The National Health Guard of the Life Extension Institute is an admirable example of organization for such purposes as these.

It is not alone for education in the laws of individual hygiene and sanitation, however, that the public should be enlisted in the health campaign. If we really want to prevent preventable disease, we must supply the machinery, the fortifications and munitions of war, to use against the enemy. We must install effective

water purification plants and adequate systems of sewerage and sewage disposal. We must provide infant welfare stations in the proportion of one for every 20,000 of the population if the death-rate of infants is to be effectively reduced. We must have adequate systems of medical inspection and school nurses, not one for each 2,500 school children but one for every 1,000, if our young soldiers of peace are to come to maturity in full vigor and free from physical defects. We must build contagious disease hospitals with a capacity of one bed for every 2,000 of the population. We must provide tuberculosis hospitals with a capacity of one bed for every 1,000 of the population, for the cure of early and the isolation of advanced cases of this disease, and corps of visiting nurses to find incipient cases and secure proper care for patients in the home. All these things cost money, and in order to secure them we must have in each community an aroused and organized public opinion. We can form such an opinion if we will educate and continue to educate. The same diffusion of knowledge which equips the citizen to cope with the problems of personal hygiene will ensure his coöperation in community efforts against preventable disease, will convince him that public health is indeed purchasable, and that in very fact a community, within natural limitations, can determine its own death-rate.

IS GASTRIC ULCER PRIMARILY DUE TO AN INFECTIOUS ORGANISM?

At a recent meeting of the Medical Society of the County of New York a very interesting discussion took place as to the etiology of gastric ulcer. The work of Doctor Rosenow, showing that an infectious organism was probably responsible for the development of ulcers in the stomach and small intestine, was dwelt on with particular emphasis. Through all this discussion one possible causative factor was completely lost sight of, viz., the influence of sedentary occupation, and of nervous strains associated with various vocations, in producing digestive disturbances, which might well lay the ground-work for future ulcerative conditions, whether these be caused by infectious organisms or otherwise.

The clinicians who inquire carefully into the habits and occupations of their patients, especially those suffering from digestive disorders, must have been struck by the frequency with which such cases give a history of nervous strain associated with their work, of sedentary employment, and of brief lunch periods that compel bolting of food and allow no time for mental and physical rest before returning to work. Especially illustrative may be the cases among poor students who often suffer from a combination of these occupational factors, as well as from cheap and improperly prepared food; among these frequent complaint may be heard of pyrosis and epigastric distress, which continue in many cases unabated throughout student days. With the freedom from the nervous strain and sedentary employment incident to studies that follow upon their entrance into professional life, there comes often a most decided improvement in health with respect to gastric complaints, until such time when professional duties begin to multiply and nerve strain once again becomes a dominant factor.

The number of shop girls, clerical workers and others who are subject to occupational influences which predispose to disturbances of the digestive organs would probably be found to be very great if careful occupational histories were as much in vogue as they are at the Massachusetts General Hospital, and at the University of Pennsylvania Medical College and Hospital, which is now taking up occupational diseases in an intensive way.

The lowered state of resistance, local and general, which these digestive complaints may induce, would, it seems, favor the action of infectious organisms, if indeed, in the ultimate analysis, the latter are definitely proved to be the cause of gastric and duodenal ulcers. Admitting that this observation is applicable in only few cases, it is, however, important enough to deserve careful study by internists, who, by timely advice, might prevent the development of ulcers and overcome the occupational influences that predispose to this condition. In many cases, violent as the economic readjustment might well have to be, it would seem more in accord with the spirit of the modern preventive medicine to counsel a change of employment; radical as the effects of such advice might be, it is vastly more conservative than allowing a patient to drift into invalidism, with severe surgical treatment, or even malignant degeneration of an ulcer as the ultimate goal.—*Bulletin of the New York City Department of Health.*

THE SUPPRESSION OF THE DRUG VICE CONSIDERED FROM THE DEMAND SIDE.

J. FRANK CHASE,
Secretary of the New England Watch and Ward Society, Boston, Mass.

Read before a General Session of the American Public Health Association, Rochester, N. Y., September 9, 1915.

In this paper the author attacks this vice from a new angle. Continue the restriction of the supply, but also cure the users.

IN HIS book entitled "Prostitution in Europe," published under the Bureau of Social Hygiene, New York, Abraham Flexner, the able investigator employed by Mr. John D. Rockefeller, has among other things set forth an economic principle in such a way as makes the book a valuable contribution to the literature on the "social evil." He has applied the economic law of supply and demand to that vice in such a way as to throw great light upon it. He distinguishes between the supply factors and the demand factors in that vice, and points out the influence of each upon the other and how each must be controlled. The use of this law in that field enables us to grasp the conditions of the solution of the problem more firmly than ever before. It gives us power to think the problem through, it makes the problem more manageable to the human mind; it is a very fruitful idea giving birth to many new thoughts on the subject.

We see by it, for example, how one-sided many efforts in the past to solve the problem of the social evil have been. Attempts have been made to manage it by dealing almost wholly with the female or supply factor by a process of law enforcement while neglecting the demand factor or the male end of the vice by such forces as special education in social hygiene, social condemnation, punishment, purified environment, moral and religous instruction, and last but not least opportunity for innocent recreation. The demand for illicit intercourse, Flexner shows, is not alone the result of a constant pressure of natural impulse but can be stimulated and in commercialized vice is systematically and highly stimulated by such forces, for instance, as obscene books and pictures and intoxicating liquors, and conditions under which their sale is surrounded. The demand, on the other hand, can be affected and diminished by education and by other methods of preventing the artificial stimulation of the demand. Past efforts devoted only to suppressing the supply and paying no attention to the demand have simply made motion without progress. Too often we have only changed the form of the supply and have not really suppressed it. Law enforcement to suppress the supply and education and other distinctly preventive processes to suppress the demand is the sum of human wisdom in the suppression of this vice at present. These two methods of law en-

forcement and education must go hand in hand. Failure to recognize and deal with both factors—supply and demand—has been one of the mistakes of the past.

Are we not falling into the same error in dealing with the habit-forming drug vice? In this vice there are also two factors, the supply factors and the demand factors. Have we not been paying too much attention in its solution to the supply factors? The Harrison Bill attempts almost wholly to regulate the supply for the United States. State laws are almost exclusively concerned with restricting the supply within the state. We have been trying to suppress the vice by restricting the supply.

The effect of restricting the supply, however, has been greatly to increase the price of these drugs. This prevents the acquiring of the habit by many and forces a large number to break it off, but the habit still has a large number so tenaciously in its grasp that the enhanced price does not drive them from it. When the price reaches the figure it has in Boston it is a question how much farther the vice can be suppressed by restricting the supply factors.

Under such conditions, with the vice still existing, we are forced to cast about for something else to help us in our struggle, and help, we believe, will come mainly by considering the demand factor in this evil.

The demand factor, of course, is represented by a mass of human beings who have the intolerable craving for drugs. If we could relieve them of their craving by curing them, then the illicit demand would cease. What then can be done to minimize the demand? Have we really seriously considered this side of the question in the past?

In his excellent pamphlet entitled "The Present Status of the Drug Addiction in the United States," Dr. Lyman Kebler of Washington, D. C., gives us the judgment of several hundred physicians throughout the United States as to the causes which have led to the contraction of the habit by drug victims.

These causes are in the main, four.

1. Careless prescribing by physicians.

2. Self-medication and patent medicines.

3. Bad company and dissipation.

4. Hereditary influences, neurotic temperament and degeneracy.

These four causes, then, promote this evil and if we aim to influence the demand for drugs we must find a means of removing the causes. I can do little more than to raise the question—how can these evils be remedied and how can the victims be rehabilitated.

I am going to point out five practical measures which aim to accomplish this end.

I. *We can diminish the demand for drugs by segregating and medically treating the drug victims who are also criminals.* It is always dangerous to give figures but I venture to state that 50 per cent. of the victims that come to our notice are men with criminal records. It may be that even 60 per cent. or 70 per cent. have criminal records, I cannot, of course, say just how many, but I know that a very

large per cent. have been found such in our experience. The habit itself naturally and fatally leads its devotees into a criminal career. Three years ago in one group of cases presented to the court by the New England Watch and Ward Society, the reform organization which I represent here, of 19 prosecuted for peddling drugs *all* confessed that they were drug users. We followed their subsequent history for two years and found that before the first year after their arrest had passed, one had been indicted for murder in the second degree and given twenty years in state's prison; one had been sentenced for highway robbery and given seven years in prison, and seven had committed crimes for which each one was punished within the year by not less than six months in the House of Correction. At the end of the second year, at another round-up of thirty-two drug peddlers by the officers of the same society, all but two of the original nineteen were in the House of Correction, and of these two, one had died of his drug habit and for the other we had a warrant.

While these perverts pass through our penal institutions and while wards of the state, is it not criminally negligent in the state not to treat them in such a manner as to cure them of their habit? I believe that in the majority of our penal institutions habit-forming drugs can be secured by the inmates more easily than when at large. Too often there, habits are fostered and increased, aye even contracted. The reason for this failure to control the situation more effectively is that we chiefly aim to keep drugs out of our jails by shutting off the supply, a process fraught with great difficulty and almost impossible. We must stop the demand; we must segregate the drug victims and medically treat them. By this means the demand for illicit drugs will be lessened to a point where no supply will be forthcoming to meet it. A compound within the jail, specially guarded, and presided over by a medical expert with a dietary and general regimen such as a drug victim needs, would send out into the world men freed from a habit which if not cured, is sure to lead them to commit other crimes which in turn would soon bring them back. I am dealing here also with a great breeder of drug victims for it is in the jail where bad company is apt to be most fatally effective; here inmates must daily associate with others who are drug-users and consequently the newcomers acquire the habit. It is, therefore, of the utmost importance to take such steps as will tend to cure the criminal drug-user and at the same time prevent the contracting of the habit by others confined in penal institutions.

II. *Again we can reduce the demand by the creation of custodial institutions for non-criminal drug users.* Some states today have drug-curing institutions, admission to which is voluntary. These institutions were formerly for the cure of the liquor habit but have, through changed conditions, gradually become drug-curing institutions. The theory that no man can get cured of his drinking habits and then stay cured except by his own volition, has led to the error of thinking the same way about the treatment of the drug

habit. A cured drunkard must pass a hundred saloons every day out of which he can be kept only by the exercise of his will. The will, therefore, must be educated. But with the drug-user conditions are not the same. He can get drugs only under difficult conditions. If his system can once be eased of its craving he can easily be kept from obtaining a new supply of drugs because unless he wants them intensely he will not pay the price or undergo the difficulties necessary for their possession. Hence the liquor problem is somewhat different from the drug problem.

Institutions where drug victims can voluntarily commit themselves and can leave them when they wish to are of limited usefulness. And this is so for several reasons.

1. In what condition to form a resolution to get cured is a man when he is in the grip of the habit?

2. If he has that resolution, in what condition is he to decide intelligently whether he would better stay in an institution or not when the agony of abstinence is on him?

It would be a mercy to such a man to say, "You must go to an institution," and later, "You must stay," and to force him to stay to complete his cure until the craving has disappeared. In order to make such an institution adequate we must find some way of getting a custodial hold upon drug-users. To do this it is necessary to devise a more intelligent test for deciding when a man is in reality a drug victim. In Massachusetts a person can be committed to certain drug-curing institutions when he "is so addicted to the intemperate use of narcotics as to have lost the power of self-control." With the present law the result is that the man cannot be committed unless he can be surprised at a time when he is actually in a drug stupor.

This is a very difficult thing to do and such a test usually results, therefore, in the continuance of his habit until he has become totally abandoned. The fact that he can continue so long without being forced into a cure means that during his career he is likely to lead many other persons to take up the very habit that is crushing him. Contrary to expectation the drug habit is not a solitary vice but rather is a sociable one. In it the principle "misery loves company" finds one of its best illustrations.

Two reasons, therefore, favor the custodial institution; the opportunity to effect an early cure of the habit of the individual and the possibility to rid society of a man who is a menace to its mental and physical health. This process of committing victims to a custodial institution would clear our streets of a class of persons who are in their way as dangerous as those infected with contagious diseases. We believe that association with drug-users is at present the greatest single cause of the drug habit within the class that comes within our observation. There is a kind of social suggestion by which the habit is spread by the power of example from one to another; and thus one drug victim in a community will in a short time lead scores of others into the habit. This he does for practical reasons, since those

who are led into the habit form his clientele and he gets money for his own supply by furnishing them with drugs.

The power ought to be vested in the court to commit an habitual user to a custodial institution for a time and power given to certain custodial institutions to keep a man there even against his will until he is cured. In Massachusetts we have some splendid drug-curing institutions for those who seek admission and who persevere in grace, but there are none except the jail where a recalcitrant can be forced to persevere however great his objections. The jail cure is simply that of abstinence.

I believe that most drug victims have lucid moments when they would commit themselves or when they would not resist committal if provision were made. When in the throes of the cure these same individuals would become refractory and if allowed to do so would leave the institutions.

Besides being a social purifier by clearing the streets of sources of contagion, the custodial institution is merciful because it provides a cure without a criminal record. If there were such institutions, men who are now sent to jail and given a criminal record for having drugs illegally in their possession could be sent to the custodial institutions and cured. The very fact that a man cannot be kept against his will in a drug-curing institution means that all attempts to help a drug addict by some of the common methods fail.

When a new offender is before the court, a humane prosecutor frequently would like to recommend mercy to the court and to ask for probation for the defendant. Without a custodial institution to which to send such a man, probation means little. The judge at times gives him probation provided he will undertake a drug cure. He agrees to do so but is not forced to go at once and at times we find him even a week later on the streets not yet having entered the institution. Only when it suits him does he go. If he does not like the place he may strike a nurse or become obstreperous with the result that he is sent away, or he may not strike anyone but decide to leave via the fence—he is not sent for to return; he is free. It is likely that if he returned to the jurisdiction of the probation court he might be surrendered, but even that is not certain and generally no penalty is visited upon him unless he comes before the court charged with some subsequent offence.

If a custodial institution existed he could be placed on probation provided he committed himself for treatment, and if he committed himself he ought to be compelled to stay for a sufficient period to effect a cure.

It should be noted that so far I have dealt mainly with the influence of bad company as a cause of drug victims. Now I am going to consider remedial measures for the other causes.

III. Thirdly, then, what can be done to remedy the next great cause of the contraction of the drug habit—to wit—careless prescribing on the part of physicians. I am not educated in medicine so that I must not venture to say more than a layman is permitted to say.

This problem could be attacked in

two ways: (1) by better law and its enforcement, (2) by education and coöperation on the part of medical societies.

The general type of law in the several states today reads: "It shall be illegal for a physician to prescribe habit-forming drugs to a person known to him to be an habitual drug-user except it be considered therapeutically necessary." But even the enforcement of such a simple restriction encounters the greatest difficulties, so that the prosecution of a physician is seldom attempted. Let me enumerate the difficulties in the hope that some genius in the future may be able to obviate them.

The law provides that it is criminal to prescribe for a person known to the physician to be addicted to drugs. For the physician to know it the man must actually be so addicted. Now if a man is in reality a drug victim the courts will not believe anything he says so that the physician can refute all he may say in court. How could the physician know him as a drug-user unless the drug-user actually tells the physician? If the drug-user tells the physician he is a drug-user the physician can believe he is lying to him and still give him what he asks for. But one cannot establish by a drug-user the fact that he told the physician he was one because the doctor and patient are alone in the office and there is no way of breaking the balance by means of a third witness, and a doctor who will feed a drug victim's habit will not scruple to perjure himself on the stand. But even suppose he is not desperate enough to perjure himself he can still say that he believed the drug was therapeutically necessary; can say, moreover, that he prescribed with instructions to the patient to take constantly diminishing doses. The prosecution might meet the therapeutic defence by putting an expert on the stand to testify that the prescription was not an ethical one, but I have had experience in trying to find an expert who would go on the stand against a fellow doctor or a fellow druggist. Perhaps some professor in a medical school might do so, but not a practising physician. They feel it would hurt their practice.

If, in the law, the words used were, instead of the words "Known to be a drug-user," "Known to be a drug-user or claiming to be a drug-user," we could then send in a detective who could test the drug business of a physician and, if the detective were in reality not a drug-user, his word might count against the physician, except that he would have to weaken himself by having to confess that he used a pretext to the physician in order to gain evidence against him.

With some better law the bad doctors could gradually be weeded out. But I believe the second method is at present the most hopeful, viz., that of education—education of the ethics of physicians by a propaganda carried on in the medical societies of this country. This might be systematically promoted. Just what that medical education should be I cannot say. But one thing I feel sure ought to be done, each medical society should appoint a body of able men who might be known as the Law Enforcement Com-

mittee, whose duty it should be to stand ready to appear in court and testify whenever called upon and they should be paid a fair fee for their services. By their appointment it would be known that they were acting with the backing of the best medical men in the state and the boycotting and persecution of these experts would then be obviated.

Then again, each medical society ought to be prepared to welcome a complaint against and should deal with any member against whom complaint of unethical conduct with respect to drugs is made.

But that would not reach the great difficulty because in my experience the physicians who are the greatest offenders are physicians who belong to no medical societies, hence are not subject to such control and influence. These can only be reached by some better law than any state has yet invented.

IV. Again, self-medication by way of patent medicines is a great cause of drug addiction. To affect the drug demand something must be done in this field. I do not find that drug victims utilize patent medicines to satisfy their drug craving. The minimum quantities allowed without prescription are not satisfying to drug-users. The patent medicine does its harmful work with the person unaccustomed to the drugs. These preparations may be habit producers, but are not habit satisfiers. It is generally provided by statute today that if a patent medicine contains habit-forming drugs that fact must be placed on the label. That is good so far as it goes, but the average layman does not realize when he sees on a label the statement diacetyl morphine, codeine, dinin, heroin, or cannabis indica, that he is running any danger. Lest a habit be formed, would it not be well to state on the label in addition to the name of the drug the words, "A habit-forming drug," and a few words of warning against using it in large quantities or more frequently than directed?

It would be well, also, to gather facts to be used in some plan for a general education of warning against acquiring any of the drug habits. It is startling to learn how short a time it takes to acquire a habit. Suppose it were known that to take a quarter of a grain of morphine daily for two weeks would start a habit, would the knowledge of this fact not be a great deterrent? A bottle of a cocaine catarrh cure snuffed regularly will start a habit. Such facts as these ought to be made public and they would deter many from carelessly dosing themselves with these poisons.

V. Lastly, "hereditary conditions" have been named as a cause of drug addiction. I have only one suggestion to offer under this heading. Feeble-mindedness has been found to be a predisposing condition leading to prostitution. Over 50 per cent. of the prostitutes in a large city of the United States were by the Binet test found to be what are known as feeble-minded. Experience shows that many prostitutes are habitual drug-users. I have often wondered if perhaps there might be a relation between feeble-mindedness and the drug habits. Perhaps feeble-mindedness is a predisposing cause in many cases; whether

or not there is a connection would be worth finding out. This could only be done by a careful chart study in some institution where the mental life of drug addicts is carefully tabulated. If it is a predisposing cause some education to fortify the feeble-minded person against this weakness could easily be begun in the early years; moreover, when such individuals are known and classified, extra care could be taken by medical men in prescribing for them.

I have pointed out only a few of the possible measures for restricting the demand for drugs as a way of suppressing the drug vice. The measures aimed to restrict the supply must of course still be continued. I am only urging that these other preventive measures affecting the demand might wisely be added.

"These things ought ye to have done and not to have left the other undone."

◆

FRAUDULENT INFANTILE PARALYSIS "CURES."

The Department of Agriculture Instructs Food and Drug Inspectors to Watch Interstate and Foreign Shipments for Fraudulent Remedies.

Officials of the Department of Agriculture, charged with the enforcement of the Food and Drugs Act, expect that the outbreak of infantile paralysis will tempt unscrupulous persons to offer for sale so-called "cures" or remedies for this dread malady. They, therefore, have issued special instructions to the food and drug inspectors to be particularly alert for interstate shipments or importations of medicines, the makers of which allege that they will cure or alleviate this disease, for which, at the present time, no medicinal cure is known. The officials also warn the public that any preparation put on the market and offered for sale as being effective for the treatment of infantile paralysis should be looked upon with extreme suspicion. Inspectors, accordingly, have been instructed to regard as suspicious, and to collect samples of, all medicines in interstate commerce for which such claims are made. Makers of such fraudulent remedies will be vigorously prosecuted whenever the evidence warrants action under the Shirley Amendment to the Food and Drugs Act. So-called remedies for infantile paralysis, which are offered for import into the country, will be denied entry.

The food and drugs officials are particularly watchful in this instance because it has been noted in the past that, whenever a serious epidemic exists, unscrupulous dealers prey upon the fear or ignorance of the public by flooding the market with worthless, hastily prepared concoctions, for which they assert curative properties which have no foundation whatever in fact. In the present instance, inspectors already have discovered shipments of a few such mixtures.

The Department will do everything it can under Federal law to protect that portion of the public which is extremely credulous in times of panic and which will grasp at anything which promises protection or relief. The sale of such products at this time, the officials point out, is particularly threatening to the public health because many persons, relying on the false statements of impostors, neglect to secure competent medical advice. As a result, not only is the safety of the patient endangered, but in the absence of proper sanitary precautions, the likelihood of contagion is greatly increased.

It must be understood, however, that the Federal Food and Drugs Act applies only to products which are shipped in interstate commerce, that is, from one state to another, or which are offered for import or export, or which are manufactured or sold within a territory or the District of Columbia. Products which are made and consumed wholly within a single state are subject only to such state laws as may apply and are under the control only of state health officials. The Federal law does not apply, for instance, to patent medicines made within the state of New York and sold in New York City. Persons buying or using a "remedy" made in their own state, therefore, must rely on the protection accorded them by their local health authorities.

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PRACTICAL USES OF CANCER STATISTICS.

The cloud of controversial dust that has been raised over the question of the increase of cancer tends to obscure the vision of the practical problem which this disease imposes on the community and on public health officials. There is some danger of reaching the unfortunate conclusion that unless cancer is proved beyond the slightest possibility of doubt to be steadily increasing no clear duty of combating its ravages rests upon the public and the medical profession. In other words, over emphasis of the relative significance of the disease with reference to the factor of time may lead us to overlook its relative significance with reference to other diseases which afflict mankind, as well as its present absolute importance as a cause of death. An easy method of rectifying the vision and one that every health officer should occasionally indulge in, not only as regards cancer but in order to illuminate his whole field of work, is to study the simple graphic chart which prefaces the Census Bureau's Report on Mortality Statistics for 1913. This diagram shows cancer in fifth place among the leading causes of death, with a fatality rate which, if applied to the estimated population of 1915, would indicate a total of over 80,000 deaths from this disease in the United States during that year.

With respect to cancer as with the other diseases, it would seem futile to question the broad lessons of this chart. Undoubtedly the improvement of statistical methods and increased accuracy of diagnosis would bring changes in the totals and possibly in the relative positions of some of the chief causes of death.

Such corrections, however, could hardly invalidate the present conclusion that cancer ranks among the chief causes of mortality and exacts an annual toll of life so high that all possible efforts on the part of organized society are called for to control its ravages. The present statistics, however imperfect, may surely be relied upon to point the way to the health officer's chief problems. Studying the Census Bureau's figures, many a well trained and thoughtful sanitarian must regret the time and energy which one-sided and over stimulated public opinion compels him to spend on the relatively insignificant problems of nuisance abatement and minor food adulterations, while really important work has to be neglected. Cancer undoubtedly occupies a high place among the more vital health problems. While it is not an infectious disease within the old-fashioned health officer's purvjew, there is much that the modern health department, with its diagnosis laboratories and its systematic propaganda of public health education, can and ought to do to reduce the total of unnecessary deaths from the malignant diseases by securing their earlier recognition and treatment. The plural is purposely used, for pathologists now regard cancer not as a single well defined disease, but rather as a popular name for a group of allied but differing diseases, with varying causes, courses and results, still further complicated as they attack different organs and parts of the human mechanism. The separate and careful study of these varieties of cancer with due regard to sex, age, race and organs affected and to the conditions under which they arise may possibly contribute as effectively to the final solution of the problem of malignant disease, as any experimental work in the laboratory. These prosy statistical investigations are less likely to be heralded in the newspapers than demonstrations of cancer heredity among mice, but the practical results may eventually be quite as serviceable to humanity.

Though the question of cancer increase may be over emphasized it is undeniably important to have it settled in order that more accurate direction may be given to efforts to control the scourge. If the group of malignant diseases is not only a great but a constantly greater liability on the health ledger, a rational system of community accounting must seek to determine how and where it is undermining our credit. In other words, refined and improved statistical methods must be applied until they tell us just how the increment manifests itself, in what countries, among what races, at what ages, and whether there is a uniform increase or decrease when the death-rate is analyzed according to organs and parts of the body. In this direction information never before supplied in this country will be available with the publication of the special monograph on cancer mortality now in preparation by the United States Census Bureau. This report will show for the first time in the United States registration area and all its local subdivisions, the incidence of cancer on some thirty organs and parts of the body with appropriate separation according to sex and race. Moreover, unprecedented effort has been made in this report to classify the returns according to certainty or uncertainty of diagnosis.

Without doubt, however, the most useful contribution to this line of investigation so far actually published in this country is Frederick L. Hoffman's recent work on "Mortality from Cancer Throughout the World," reviewed elsewhere in this number. The volume is a mine of practical information for public health officials as for other lay and professional students of this disease. Not the least valuable service rendered by Doctor Hoffman is his insistence on the pragmatic standard of sufficient accuracy for working purposes in American vital statistics as they stand today. The author is too experienced in this field not to recognize the limitations and disadvantages under which causes of deaths are determined, registered and tabulated under our varying laws and jurisdictions. Yet conspicuously among American statisticians Doctor Hoffman has constantly emphasized the practical and social bearings of his profession and in his latest work he has again driven home his conviction that vital statistics are a guide to practical effort and not a metaphysical discipline. Transcending questions of somewhat more or less which might result from mathematical refinements, he holds his vision steady upon the broad conclusions which stand out from the great mass of cancer data he has accummulated. Though he insists that cancer is much more of a menace than has hitherto been supposed, and holds strongly to his belief that the recorded increase in the death-rate reflects for the most part a real increase in the disease, the author nevertheless does not content himself with dogmatic assertions. There are few localities that have escaped the sweep of his comparative method and many an American registration officer will find his own reports here tabulated along with those of cities and areas all over the world, to the end, incidentally, of emphasizing significant differences which the author regards as proving beyond question that variations in the cancer death-rate are real and due to local factors of fundamental importance rather than to any fault of diagnosis and registration. To the further study of these stimulating questions and to the improvement of technical methods, Doctor Hoffman urges us in full faith that perfected statistical analysis has a brilliant future of service to humanity in assisting in the progressive reduction of this ancient fortress of human suffering.

PHYSICAL EXAMINATION OF EMPLOYEES.

JOHN B. ANDREWS,
Secretary, American Association for Labor Legislation.

Read before the Industrial Hygiene Section, American Public Health Association, Rochester, N. Y., September 10, 1915.

PERHAPS no single practice in the field of health has excited more bitter opposition in the past few years than has the physical examination of employees. Although individual medical examination admittedly furnishes almost limitless possibilities for the promotion of personal and industrial hygiene, and although it is freely admitted that we are practically certain to have more physical examinations rather than less in the immediate future, the practice has recently aroused the bitter antagonism of organized labor. This opposition has come as a shock to many well disposed citizens, including some physicians and some employers. It is a matter of practical interest to those concerned with industrial hygiene to inquire "Why this opposition?"

Physical examination of employees was first instituted on a large scale in this country by those private employers who took the lead in developing what they once proudly called "welfare work." (The name has gone somewhat out of fashion of late.) The National Cash Register Company made physical examination of applicants for work as early as 1901. The practice spread, particularly among those large employers who like to do things for labor and are at the same time strong enough to ignore labor's desire to tell them what it wants.

A little later the popular interest in efficiency gave a "scientific" handle to the philanthropic welfare movement and labor became alarmed. But it was not until workmen's compensation laws furnished an obvious financial motive to some employers—especially the "self-insured"—to weed out the poorer risks that the practice of physical examinations became widespread and caused a determined outburst. The reason for the financial incentive is not hard to find. President De Leon of the Casualty Company of America has said medical examination of employees is the "preventive basic principle" of workmen's compensation insurance, and as such it serves to reduce the cost of insurance. The workers have sensed the relation between the two movements, and down in Ohio where they still have a compulsory accident insurance fund the State Federation of Labor last year went so far as to order the introduction of legislation to make it a penal offense for any employer to ask or require a physical examination of his employees!

Last spring I wrote to about twenty friends who are prominent leaders in their respective labor organizations and asked them to tell me what they thought about the desirability of physical examination of the workers. Without exception a vigorous protest

against medical examination came with every reply. Several of these correspondents admit the value of physical examination to workers in especially hazardous employments, as, for example, under compressed air and in the lead trades. But they are emphatically opposed to its general introduction because, they maintain, many workers would lose their jobs. Not only physical unfitness, they declare, but also activity in a labor union would cause the dismissal of employees under the pretext of safeguarding health. A prominent officer of the International Iron Moulders' Union—one of the most conservative and active leaders in the labor movement—wrote me as follows:

> In a general way I am most emphatically opposed to any physical examination of employees. Physical examination conducted under private auspices, that is, by physicians in the employer's hire, should not be tolerated for a moment.*

But note his conclusion:

> If the state would meet all of the necessary expenses of treating diseased workmen until their health had been restored . . . I might not have as strong objections.

Frequent reference is made to examinations forced upon their employees by employers who are "self-insured" under workmen's compensation laws. It is charged that each firm is a lawmaker for itself when it makes its own rules relative to physical examination and establishes for itself the physical standard which workmen must have in order either to secure employment or to retain present positions.

A California labor editor wrote recently:

> There seems to be an epidemic on among employers for the physical examination of employees. . . . These examinations are conducted more in the interests of profits than for the improvement of health conditions, and labor must insist that there shall be a well-defined limit to them until such time as ample provision shall have been made for the safeguarding of the health of the worker and caring for those excluded from the privilege of working because of the examinations.

However, the pioneer work of physical examination has been pushed forward both scientifically and unselfishly by many American employers. Particular mention should be made also of the admirable work of education among employers accomplished through such organizations as the Chicago Tuberculosis Institute and the Life Extension Institute in New York.

Medical officers, describing the work of their respective firms, agree in praising the good results of medical examination. This practice has, according to them, benefited the firm by increasing the efficiency of the worker. It has benefited both the firm and the worker by eliminating many sources of contagious diseases and by raising all workers to a higher standard of health. Doctor Goldwater, Commissioner of Health of the City of New York, has given a big impetus to medical examination which he calls "the next step in preventive medicine."

In fact, when we turn to public and educational authorities in search of qualified opinions regarding physical examination, we find that many Amer-

* He mentions, however, as exceptions the examination of the eyesight of locomotive engineers, and the examination of workers in peculiarly unhealthful industries for the purpose of studying the effects of the occupation upon health.

ican cities have introduced medical inspection of school children; at least seventeen of the larger colleges and universities require thorough medical examination of all new students, which is followed in some of these institutions by periodic reëxamination and free treatment. Applicants for the army, navy, police and fire departments, and civil service employees, are also commonly required to present certificates indicating a certain physical standard of health. A suggestive point to be noted is that most of these groups, in so far as they are gainfully employed, are also provided with some form of public sick leave or pension during incapacity.

Voluntary efforts to meet the need of sick relief have been made by many employers. Often these attempts have been in the form of mutual aid societies, largely supported by the workmen and sometimes controlled by the employers. The relief afforded has frequently been inadequate, and the control has often been irksome or repressive. In answering the question "What advantages do you find in physical examination?" one employer confessed:

> There is a double purpose in our examinations. Ostensibly they are for the Mutual Aid Association but in reality for the company; thus a double function is performed.*

Medical examination of workers has been undertaken not only through voluntary efforts of employers, but also as the result of legislative enactment. In so far as industrial workers are concerned, legislation is fragmentary but steadily increasing in extent. Physical qualifications established by law are of four kinds: (1) reasonable immunity from the trade malady characteristic of the employment; (2) freedom from a trade malady contracted in the course of employment; (3) freedom from a contagious disease which might be passed on to other workmen or to consumers of the product; and (4) freedom from physical defect of such nature as to interfere with the proper performance of duty. It will be noted that the first two qualifications look toward the health of the workman himself, and that the last two look mainly toward the health and safety of other persons.

Disqualification because of susceptibility to a known occupational disease is found at present in only two American laws, but is more common abroad. The New York and New Jersey statutes regulating work in compressed air require that applicants must be found physically qualified by a physician paid by the employer, and these laws also exclude persons addicted to the excessive use of intoxicants.

It is obvious, however, that merely debarring from entrance to an unhealthy trade those demonstrably susceptible to its dangers is insufficient protection. The worker's real power of resistance to a specific hazard often cannot be determined until he has been exposed to it, and if he begins to show symptoms of succumbing he cannot be too quickly removed.

Hence arises the necessity for the second disqualification, illness from a trade malady contracted in the course of employment.

* 100 Per Cent: The Practical Magazine of Efficient Management, Vol. 5, No. 2, August, 1915, pp. 64–65.

Most common occupational diseases are of such slow inception that a capable physician can detect them in their early stages before their cumulative effects have become serious. To make sure, therefore, that the originally healthy employee is in fact successfully resisting the risk with which he is surrounded, the initial examination, when it is given, must be supplemented by periodical reëxaminations at intervals graduated according to the degree of risk. Sometimes periodic examinations are required even when there are no restrictions as to entrance to the trade.

Such is the case with the monthly examinations required under the "lead laws" of the important lead using states. The Ohio and Pennsylvania laws apply to the manufacture of certain of the more poisonous lead salts, such as white lead, red lead and arsenate of lead (Paris green), while the later New Jersey statute covers also the manufacture of pottery, tiles, or porcelain enameled sanitary ware in so far as lead is used. In all of these states the physician who discovers a case of lead poisoning must report it not only to the state departments of labor and of health, but also to the employer, who after five days must not continue the "leaded" employee in a dangerous process nor return him thereto without a physician's written permit. Earlier laws in Illinois and Missouri cover wider ranges of related industries, including zinc smelting and work with arsenic, brass, mercury and phosphorus, but do not require the removal from danger of workmen who show symptoms of the resultant diseases.

Provisions for regular examinations are also found in the two American compressed air laws already mentioned. Under these the examination must be repeated after the first half day's work, on returning to work after ten days' absence from any cause, and after three months' continuous employment, and workmen who have ceased to be qualified must be excluded.

In the more dangerous lead trades workers are subject to regular examination in nearly all European countries, and in Belgium a worker who is attacked by plumbism at frequent intervals must be excluded from lead occupations permanently. England and Germany, moreover, require examinations both in alkali chrome works, where corrosions of the mucous membrane are common, and in rubber vulcanizing works, where there is danger from the noxious gas bisulphide of carbon. France requires similar examinations in compressed air work.

The frequency of examination varies from once a week in the British white lead industry, to every six months among German painters, although once a month, as in the American lead trades, is the most usual period. In the Netherlands stone masons are entitled to medical examination at the employer's expense once a year.

In order that the advantages of cumulative experience may not be lost, a factory record of the results of medical examinations, especially if they result in findings of disease, is nearly always required, and must usually be kept by the examining physician. In Germany this record is called a "control book," and must contain the name of the person keep-

ing it, first and last name, address and age of each workman, date of his entering and leaving the employment, date and nature of his illness, date of his recovery, name of the factory physician, and dates and results of the medical examinations. The employer is responsible for the correctness of the record, and must show it to the factory or medical inspector on demand.

The third physical disqualification, contagious disease, is applied occasionally in bakeshops and in other food establishments, while physical defect which might interfere with proper performance of duty is mentioned in a few states which require an examination of railroad employees for color blindness or other defective sight.

From this system of medical examination the employers gain, as has been pointed out, more efficient workers. For the physician, also, the practice of examining large bodies of men at the place of employment will lead to added insight into the trade causes of disease, an insight which is as yet only rudimentary. The advantages to the workmen, gained by exclusion or timely removal from a disease-breeding occupation, may outweigh the hardship due to temporary loss of wages while awaiting recovery or securing other work. Even this wage loss, when exclusion is due to illness, can in large part be taken care of by the extension of workmen's compensation to embrace occupational diseases and finally by the institution of systems of public health insurance.

Furthermore, the workmen's present objections to medical examinations conducted by physicians hired by employers would disappear when the examinations were undertaken by a staff of independent physicians employed by the insurance funds. The loss of employment on account of ill health will be more than counterbalanced by the opportunities for quick recovery when we have a system of compulsory health insurance through which every workman suspended on account of physical unfitness will be entitled to sick benefit administered not by the employer and his hired physician alone, but by representatives of employer, employee and the state.

In such a measure it is highly desirable that prevention be emphasized, so that the introduction of a compulsory health insurance system will lead to a campaign of health conservation similar to the safety movement resulting from workmen's compensation. A bill with this end in view has already been drafted by the social insurance committee of the American Association for Labor Legislation.* In this dual campaign for health insurance and health conservation we need the cooperation of physicians, employers and workmen.

*Copies will be mailed upon request addressed to the Association headquarters, 131 East 23d Street, New York City.

LATEST FEATURES IN THE DIAGNOSIS AND PREVENTION OF SOME OF THE OCCUPATIONAL POISONINGS.

W. H. Rand, M. D.,
Washington, D. C.

Read before the Industrial Hygiene Section, American Public Health Association, Rochester, N. Y., September 9, 1915.

Doctor Rand herein reviews some of the recent work done in other countries in connection with the problem of industrial poisonings as distinguished from infection.

THE scope of this paper and its limitations are both indicated in the title.

It takes cognizance of recent studies in the diagnosis and prevention of a few *occupational poisonings* (emphasizing alike the adjective and the noun), but ignores the infections, anthrax, hookworm disease, etc.

The data cited in this sketch are derived mainly from foreign sources, although material equally as valuable might have been obtained at home. It may be assumed, however, that every member of this Association is familiar with the contributions to hygienic progress made by our own countrymen; whereas the scraps of information that have fallen in the writer's way may not be accessible to all.

Lead Poisoning.

The quest for positive, early evidence of lead absorption (antecedent to clinical symptoms) has been vigorously prosecuted for many years; for investigators everywhere recognize the importance of diagnosis during the pre-toxic, or so-called latent stage, since preventive measures avail little at a later period.

Diagnosis.

The annals of medical research since 1912 show that Teleky of Vienna regards icterus alone as a characteristic sign of plumbism (1).

Doctor Bœttrich, sanitarian for twenty-five years in an accumulator factory, holds that for diagnostic purposes a weekly medical examination is necessary, with microscopic, chemical and physical blood tests, urinary analysis and determination of the blood pressure (2).

Professor Biondi's discovery of lead in the blood plasma is proclaimed by Giglioli as "a fact of the highest importance for the purpose of diagnosis (3)."

Embden says that hematoporphyrinuria is an early and nearly constant sign, and (if fever, and disease of the heart and liver can be excluded) it is pathognomonic (4).

Professor Schmidt of Leipsic considers that blood examinations and urinary analyses are reliable tests for the early detection of plumbism. Basophile granules and nucleated cells are of less value (5).

Sir Thomas Oliver gives the clinical histories of fourteen cases of plumbism in which the diagnosis was established and the poison eliminated by means of the double electric bath (6).

Giglioli maintains that alimentary albuminuria is a sign of incipient saturnine nephritis. To a suspect he administers the whites of six eggs, and then, at intervals of three hours, tests the excretion for albumin. Its presence determines the diagnosis (7).

Hayhurst announces that "The detection of paresis, preceding paralysis, can be made early, in the case of the arms, by the use of the hand dynamometer (8)."

In practice, even when the diagnosis is clear, doubts often exist as to the source of the poisoning; for it may prove to be extra-occupational, as in the following case:

Years ago there came under my notice a dairyman whose home was in the country, but who drove into the city every morning to serve milk to his customers. He had some of the indicia of lead poisoning. But in reply to questions only negative answers were returned. The water supply on his farm was neither pumped nor piped for use. It came from a spring near the kitchen door.

He declared that he never quenched his morning thirst with potations from the cans of *aqua lactis* which he dispensed.

It was then suggested that possibly the tin-foil wrapper of his tobacco might have leaded him. He curtly interrupted, "I don't use tobacco."

Baffled but not discouraged, my next endeavor was to obtain a detailed account of his personal habits; and the information elicited showed that it had been his custom, after making his daily rounds, to take a drink of beer before returning home. Beer drawn from the wood? No, bottled beer.

Procuring five bottles of this beverage, it was discovered that in four of them there were respectively three, two, four and seven bird shot which had been used to cleanse the bottles, and had not been shaken out. Here, then, was the *fons et origo mali*.

Prevention.

For the prevention of lead poisoning (apart from the practice of personal hygiene), the chief requisites are suitable sanitation of the workshop, and mechanical appliances for the suppression or elimination of the poisonous dust and fumes of lead.

Hence, in this department, the architect, the sanitary engineer, the machinist and the factory inspector take precedence of the laboratory worker and the clinician. In passing it is pleasant to note that the achievements of these specialists are admirable examples of ingenuity and effectiveness.

It must be borne in mind that not all operations in a given industry are equally dangerous to health; indeed, many of them may be wholly free from risk. With repetition and emphasis Hayhurst dwells upon the im-

portance of designating the particular *process* in the execution of which the workman is exposed to health-hazards.

In industries where lead and its compounds are employed, protection is needed only by such workmen as are engaged in the processes which generate dust and fumes. Where these are evolved, hoods, exhaust fans, respirators and masks become indispensable.

A miscellaneous assortment of preventive measures may be grouped together:

Devoto arrests plumbism by administering a hot bath, following it immediately with pilocarpine hypodermatically (9).

Lazana advocates the abandonment of lead and the adoption of lithopone or innocuous zinc colors as a base for paints (10).

Tauss recites the experiments made by the Austrian government to discover a substitute for lead colors. Thirty-five leadless paints are on the market in Austria, but none are quite satisfactory (11).

Landis reporting on the processes of enameling and glazing in the pottery industry, remarks that lead poisoning has been entirely eliminated by the simple expedient of having two rooms for freshly glazed wares. Each is flushed out after use (12).

Bunge says that in the enameling of porcelain, etc., lead "may be perfectly replaced" by a mixture of borax and barium salts (13).

Ranelletti affirms that persons with normal livers are relatively immune from lead poisoning, but that no one with congenital or acquired hepatic insufficiency should work in lead (14).

Rambousek relies wholly on sanitation and hygiene for safeguarding the workman (15).

In this connection attention is invited to the admirable rules for the personal hygiene of lead workers formulated in one of the recent reports of the Ohio State Board of Health (16).

Of course there is no natural immunity from plumbism, and it is impossible to mithridatize oneself so as to be proof against it. But that strict observance of hygienic precautions is a guaranty of exemption from lead poisoning appears to have been demonstrated by a recent report of the Massachusetts State Board of Health in which it is said that lead poisoning is "almost unknown in the six home establishments visited (17)."

It is Oliver Wendell Holmes who divides men into two classes—those that say "If" and those that say "As." The unpractical man speculates on what might be *if* things were different; the efficient man deals with things *as* they are. The dreamer says, If we can abolish the use of lead, mercury, etc., in the trades, there will be no more occupational poisonings. The hard-headed hygienist replies, As conditions are at present, it is impossible entirely to prohibit the use of poisons in the industries. The only feasible plan is to reduce to a minimum the inevitable industrial risks by instituting systematic measures of shop sanitation and individual hygiene.

Economic considerations affect the situation. For it would impose an intolerable burden upon industry in some instances to require it imme-

diately to install an ideal sanitary equipment. However, corporations are generally watchful as well as enterprising, and employers are usually found among the foremost advocates of health regulations.

Mercury Poisoning.

The direct diagnosis of occupational mercury poisoning is not difficult. The black teeth of the "carroters" (the men who brush with acid nitrate of mercury the fur used in felt-hat factories) and the ulcerative stomatitis of the cutters in this industry are characteristic signs of hydrargyrism.

Innocuous substances have in part replaced this metallic poison in some of the trades, so that in the manufacture of felt hats alone is the risk of mercurialism at all formidable. Many futile attempts have been made to find a substitute for the mercurial—the only preparation yet in sight which is capable of effecting the peculiar changes in the texture of the fur that are requisite to fit it for the felting process (18).

A liquid successfully employed by the Parisian firm of Jourde et Cie. and adopted later by a New York establishment employing 1,800 workmen led to the hope that mercury might be superseded by this non-poisonous preparation.

Lussigny's solution, called "Eureka," having potassium and sodium as its base, was heralded and introduced into a Russian factory as a perfect succedaneum of mercury. But this mixture has proved unsatisfactory; and though French chemists have proposed other felting compounds, their cry of "Eureka" serves only to discover the nakedness of their claims.

Prevention.

Glibert says that a Belgian plant for a considerable period used a machine for carroting, but for economic reasons has had to abandon this mechanical process. From a hygienic point of view the failure of the device is regrettable (18).

To neutralize mercurial vapors, Meyer recommends that one half liter of ammonia be sprinkled on the floor of the shop at night. Merget prefers chlorine, since the combination of mercury and chlorine vapors forms a harmless compound (calomel) (19).

The best preventives, however, are the wearing of gloves and respirators, care of the teeth, the use of hoods and exhausts, and rigorous personal hygiene.

Benzine Poisoning.

Benzine (called by several aliases in the trades) is a product of petroleum distillation of variable composition, and a hydrocarbon of the fatty series. It is not to be confounded with benzol which belongs to the aromatic series, and is a derivative of coal tar.

Diagnosis.

The characteristic symptoms, coupled with a knowledge of the patient's occupation, suffice for diagnostic purposes. There is exhilaration resembling that of alcoholic inebriation, with headache, nausea, hallucinations, and, in susceptible subjects, loss of consciousness and coma. In laundry workers the vapor often

causes vertigo and gastric derangements.

The fluid is used as a solvent for caoutchouc and fats, and for making varnish, cleaning gloves, etc. It forms the menstruum for many paints and enamels, and is known commercially as "banana oil" on account of the odor of the amyl nitrate which it contains.

Prevention.

A pamphlet issued by the Travelers Insurance Company of Hartford urges that, when this mixture is handled in a confined space, special attention should be paid to shop ventilation, and that "the men should be provided with respirators or with oxygen apparatus (20)."

Dammer suggests that it is obviously for the interest of the employer to prevent the escape or benzine vapor, and advises that cleaning be done with this agent in closed drums so that the benzine may be conserved for further use (21).

Bunge remarks that "the requirements of hygiene in this instance coincide with those of economy (22)."

Turpentine Poisoning.

This form of occupational intoxication is always acute. It could hardly become chronic, because of the rapid elimination of the poison from the system.

The diagnosis is made by observation of the distinctive symptoms. In closed rooms turpentine vapor causes headache and gastric disturbances, but these effects pass off after a few minutes' sojourn in the open air. Long-continued exposure to the fumes induces drowsiness or its opposite condition, insomnia, together with strangury (a common affection among painters). The urine is said to have the odor of violets.

Locally turpentine vapor produces irritation of the conjunctiva and of the respiratory mucous membrane. In fluid form it acts upon the skin, causing dermatitis and painful ulcerations.

Prevention.

The diffusion of turpentine fumes in the work-room should be prevented by means of hoods and exhaust pipes which capture the vapor at its place of origin and remove it by strong aspiration. Good general ventilation is also essential. Rubber finger-tips or gloves serve to protect the hands from contact with the oil.

*

Mr. Chairman and Members of the Industrial Hygiene Section:

This little excursion into the partly unexplored region where the pioneers and apostles of industrial hygiene are at work has filled me with admiration and delight—admiration for the devotion and untiring zeal with which they pursue their tasks, and delight to find that, one and all, they seem inspired with the single purpose of making scientific research subserve the public good.

Solicitous neither to controvert the opinion of another nor dogmatically to assert their own, they fling their evidences into the light and stand on

the facts. The spirit that animates them finds felicitous expression in the generous Horation challenge:

"If a better system's thine,
Disclose it freely or make use of mine."

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(6) Prevention, etc., of Industrial Lead Poisoning, *Lancet*, Aug. 23, 1913.

(7) Decorso dei sintomi e delle lesioni renali nel saturnismo, *Il Ramazzini*, April, 1915.

(8) Am. Jour. of Pub. Health, June, 1915. See also *Am. Jour. Med. Sciences*, June, 1914. (100 cases.)

(9) *Il Lavoro*, March 31, 1915.

(10) *Boletin del Departamento Nacional del Trabajo*, Buenos Aires, Dec. 31, 1913.

(11) *Zentralbl. f. Gewerbehyg.*, March and April, 1914.

(12) Am. Jour. of Pub. Health, September, 1914.

(13) Las Conquistas de la Higiene Social, p. 276.

(14) *Il Lavoro*, Aug. 15, 1914.

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(16) Industrial Health-Hazards and Occupational Diseases in Ohio. February, 1915.

(17) Report Massachusetts State Board of Health, 1907.

(18) Glibert: L'Hydrargyrisme dans les couperies des poils. 15th Int. Cong. on Hygiene and Demography, Vol. 3, Pt. 2.

(19) L'Ouvrier-son Hygiene, etc. (Martial.)

(20) Foremen and Accident Prevention.

(21) *Handbuch der Arbeiterwohlfahrt.* 1. Bd., p. 461.

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TECHNICALLY GUILTY—MORALLY JUSTIFIED.

A little after 10 p. m., Thursday, June 22, and after being out nearly a week, the jury in the Wine of Cardui case brought in a verdict for the plaintiff and assessed the damages at 1 cent. The Chattanooga Medicine Company charged the American Medical Association with having libeled it when the *Journal* declared, among other things, that the business had been built on deceit, and that Wine of Cardui was a vicious fraud. For this alleged libel it asked that it be given $100,000; it was given $0.01. As most of our readers remember, two suits were originally brought against the Association and the Editor of the *Journal*. One was a personal suit for $200,000, brought by John A. Patten, formerly chief owner of the Chattanooga Medicine Company; the other was a partnership suit for $100,000 brought by John A. Patten and his brother, Z. C. Patten, Jr., doing business as the Chattanooga Medicine Company. The suits were based on two articles that appeared in the *Journal*, April 11, 1914, and July 18, 1914, respectively. The cases came to trial March 21, 1916. On April 26, in the middle of the trial, John A. Patten died, and the personal suit was automatically abated. The partnership suit, however, was continued and this case went to the jury Friday, June 16. The case is by far the most important of its kind that has ever been tried. In addition to 498 depositions which the "patent medicine" concern took through the South from women and from doctors of a certain type, the company also put ninety-seven witnesses on the stand to testify in its behalf. The American Medical Association took only eight depositions, but did put on the stand ninety-three witnesses, among whom were some of the best known physicians in the country. The trial and the facts that led up to it could furnish texts for many interesting comments. The spectacle of a scientific organization, in its attempt to safeguard the public health, having to assume responsibilities that rightly belong to state or Federal agencies, is but one of several anomalies that characterize this case. Viewing all the facts in the case and remembering the heavy damages asked by the plaintiff, the medical profession may interpret the verdict thus: Technically guilty; morally justified! To the Association a moral triumph; to the "patent medicine" interests a Pyrrhic victory.—*Journal of the American Medical Association.*

SCIENTIFIC MANAGEMENT IN INDUSTRY AND WHAT IT INCLUDES.

DR. GEORGE M. PRICE,

Director, Joint Board of Sanitary Control in the Women's Garment Industries of New York City. Formerly Director of Investigation New York State Factory Commission.

Read before the Industrial Hygiene Section, American Public Health Association, Rochester, N. Y., September 7, 1915.

I.

INDUSTRIAL scientific management has been defined by its principal exponent* as "the efforts of a factory management to obtain maximum prosperity as a result of maximum productivity." In other words, scientific management means improved methods leading to increased industrial efficiency.

The methods of scientific management are mainly applied to the human factor in industry. This is so because of the already great progress in the application of natural forces to machinery in industry; and, also because the productivity of the human factor in industry has not kept pace with the productivity of the mechanical factor; while machinery production has been increased a thousandfold during the last two centuries, the productivity of the spinner, bricklayer, carpenter, machine worker, etc., has hardly been increased at all.

The main reason, however, why the need of scientific management to the human factor in industry has become so urgent, is because of the curb which state and society have put upon industry in its relation to the human element in factory and workshop.

During the period of the rise and growth of the modern factory system the exploitation by industry of the worker has been hampered very little, if at all. The increase in wealth of nations and progress in the supply of the world's market were then regarded as the highest social ideal to which all other interests were to be subordinated and sacrificed. Only slowly and gradually and, in spite of great opposition, has a halt been put upon the exploitation of human life and health of the workers by industry. Step by step the state began to interfere with the exploitation of child and woman's labor and with other ruthless methods of the modern factory system. Not only have the state and society interfered with industrial development at the cost of the workers, but the workers themselves began to demand better conditions of labor, shorter hours, higher wages, and general improvement in their material conditions.

When modern industry found that it could not entirely rely upon the exploitation of the human factor in industry, it then concentrated its attention upon

* Frederick H. Taylor.

the perfection of the mechanical factor and the development of all the technical and mechanical facilities of industry. Now, when technical progress has reached its apogee, industry, in its desire for greater productivity, finds itself demanding higher efficiency and scientific management as applicable to the human factor.

What are the methods usually advocated by the exponents of scientific management in industry?

These methods may be summarized as follows:

(1) Improved methods of selection of employees and their assignment to such duties as fit their character and abilities.

(2) A coördination of all the parts of the establishment so that the central purpose of greater productivity should not be lost by lack of coöperation.

(3) Specialization of functions and a greater sub-division of work, involving in each process simple and elementary motions only.

(4) A speeding up of the activities and motions of the workers by competition of the different units, by incentives in the form of bonuses, premiums, etc., and by a more scientific supervision of each group of units.

(5) Standardization applied to the human element in industry as it has already been applied to machinery and other equipment.

These, I believe, include the principal methods advocated by the exponents of scientific management in industry.

II.

It is hardly necessary to plead before a section on Industrial Hygiene of the American Public Health Association for the principle that industrial productivity and the creation of wealth, no matter how indispensable to human progress, cannot be tolerated if such progress involves danger to the health and peril to the life of the industrial population. Industrial efficiency cannot justify the sacrifice of the human element in industry. Industrial progress *must* be subordinated to the welfare of the human race.

Herein we have a valuable and sound criterion for judging the various methods included under scientific management. Whatever is inimical to health and is dangerous to life must be regarded as opposed to human progress, and whatever is conducive to the health and welfare of the industrial population must be included in rational and scientific methods of management of industry.

The majority of efficiency engineers and proponents of scientific management readily concede that there can be no industrial efficiency without a thorough sanitation of the factory and workshop.

By a thorough sanitation of the industrial establishment is meant:

(1) *The Safety and Sanitation of the Workplace Itself*—the proper construction, maintenance, lighting, heating and ventilation of the workshop, the provision for the removal of wastes and the equipment of the factory with such necessary appurtenances as dressing-rooms, lunch-rooms, wash-rooms, bath-rooms, toilet-rooms, etc.

(2) *The Conditions of Work.*—Under these may be included, beside a complete safeguarding of all parts of

the shop as well as the work and the machinery so as to prevent all possible accidents to workers, also the temperature of the shop, humidity and air conditioning, the prevention and removal of poisonous dusts, gases and fumes, and the other measures undertaken with a view of making the conditions under which work is done harmless to the workers and without any danger to their life, limb and health.

(3) *The Physical Well-being of the Worker.*—Under this heading are usually included a proper selection of workers according to their physical qualifications, a system of vocational guidance and apprenticeship and a complete system of medical supervision of the general and personal hygiene of the worker and the workshop.

Under scientific management are also included the care for the economic condition of the worker, the raising of his standard of living, the payment of living wages so as to enable him to conform to a hygienic standard of living, and also the regulation of hours of labor according to the character and dangers of the work so as not to cause undue fatigue which will lead to a loss of health and eventually a loss of industrial efficiency.

This much, I believe, is conceded and included by the advocates of scientific management. There are, however, several aspects of industrial life which are as yet not included in scientific management of industry because they are thought to be too radical or in advance of the general prevailing opinions.

These aspects of industrial life, however, seem to me to be absolutely indispensable for the bringing about of industrial efficiency because they have such a profound influence upon the health and life of the people and because they are demanded by industrial justice, upon which industrial efficiency must be based. I refer to *social insurance*, to coöperation in the joys and profits of labor, and to a share in the management of industries.

III.

The greatest curse of the modern system of production is the insecure tenure of work, the instability of employment, the periodical, seasonal and total periods of unemployment, resulting in unemployment of large masses of industrial population, an unemployment that leads to destitution, poverty and untold misery.

No system of scientific management of industry, no industrial efficiency can ever be obtained until unemployment will be abolished, until some general system of insurance will be introduced by industry and the state so as to guarantee each worker his right to his work, or to a certain minimum standard of living during its absence.

Unemployment insurance must be included under any management of industry which regards itself as scientific or just. But more than that, besides unemployment insurance, society, industry and the state must also provide for sickness, for invalidity and for old age insurance. The worker who gives up his life in order to create the wealth necessary for society is entitled to a decent standard of living

during those periods when he is disabled from work. The provision for the sick, invalid and aged should not be a matter of charity but an act of justice and should be borne by the industry to which the worker devotes his entire life.

I claim, therefore, that scientific management of industry must include an industrial and social scheme of unemployment, sickness, invalidity and old age insurance.

There is another matter which seems to me to have been greatly neglected and which should be a part of any scientific management of industry which claims to work for industrial efficiency. I refer to the sharing by the industrial workers of the joys and profits of their industry.

Work is a normal function of the human body. But it is only *then* a normal function when the work is concentrated upon objects useful to men and society, in the creation of which there is a certain joy and pleasure in the work itself. Work becomes monotonous, tiresome, and involves undue and unnecessary fatigue when it is simply mechanical, when the worker does not see the object of his work, when the work is reduced to simple unintelligent motions and endlessly repeated movements.

No scientific management in industry will ever be successful, in my opinion, if it seeks only to simplify the movements necessary for production and converts the human worker into a mere part of the machine, a senseless spoke in the wheel of industry. Productive quantity must give way to productive quality and each worker must be given a share of the joy of creation and be allowed to participate in the art of forming the final objects of his handicraft.

Not only must the worker be given a share in the joy of production, but he is rightly entitled to his share in the profits of production and this means more than that the worker should get his regular wage according to the laws of supply and demand. As the crew of a vessel share with the captain the proceeds of the salvage, so the crew of an industrial establishment should by rights share in the profits accrued by the captains of industry by the joint coöperation and work of the whole industrial establishment.

Finally, there is one more aspect of industrial production which must be included in a rational system and a scientific management of industries. I refer to the sharing of the workers in the management of industry itself. Monarchical systems, despotism and autocracy have proved and are being proved a failure in the political life of states and nations. With all its faults, we, in this country at least, have become advocates of political and social democracy. There is no reason why the obsolete system of autocracy, discarded in political life, should be so firmly established in our industrial system. Industrial discontent, conflicts, strikes, lock-outs and industrial war—the rise of class against class and the threatened industrial revolution—are all but results of the blind attempt of the captains of industry to prevent the participation of the large working class in the management of industries

and the result of the war of industrial corporations against the rising tide of the workers' organizations.

In a rational scientific management of industries the workers should be given a large share in the management of the shops and factories as has already been recognized in those industrial establishments, where, by a system of education and agitation, the coöperation of the workers has been gained in the sanitation and safeguarding of the work itself and in the devising of a better spirit of coöperation which is bound to result from a democratization of industry.

To sum up, therefore, my conception of a scientific management of industry is (1) that it includes a greater standardization of the industry itself, (2) that it should include a complete sanitation of the industry and complete care of the hygiene of the worker, (3) that it must include some systems of insurance against unemployment, sickness, invalidity and old age, (4) that industry must be so organized as to provide the worker with a share of the creative joy of work, as well as to give him a just share in the profits of the industry, and (5) that the worker be given an increasing share in the management of the industry, for industrial efficiency must be based not only on industrial justice but also on industrial democracy.

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RURAL HEALTH AMERICA'S FIRST DUTY.

Shortly after Congress convened last winter, Senator Randsdell of Louisiana, chairman of the Senate Committee on Public Health and National Quarantine, introduced Senate Bill 2214, appropriating $500,000 for the use of the United States Public Health Service, to be used in investigating and encouraging the adoption of improved methods of rural sanitation and especially for devising and demonstrating effective measures against malaria and typhoid, instructing farmers in the prevention of these diseases, carrying on necessary investigations and surveys, and coöperating with state and local authorities to eradicate these diseases in rural districts. Friday, July 14, in the Senate Senator Randsdell presented a strong argument for his bill. He reviewed the history of health legislation in the United States, showing that local regulation had generally been ineffective and that most of our advances in Federal legislation had resulted from disastrous experiences with epidemic diseases. As the representative of the Southern state in which the inroads of yellow fever have been perhaps most severe, Senator Randsdell is able to speak with authority and from personal observation. New Orleans' recent epidemic of bubonic plague and the brilliant work of the Public Health Service in stamping it out was vividly described. "Never again will there be an epidemic of bubonic plague in New Orleans," he said. "The people of that city realized that the conquest of this disease was one for the Federal government. . . . Today, as a result of the campaign against yellow fever and the campaign against bubonic plague, New Orleans is one of the healthiest cities in the world." After reviewing the work of the Public Health Service and showing the limited means available, Senator Randsdell showed that in this country, in any line of progress, education is indispensable, and that, although much educational work has been done, and although the death-rate throughout the nation has fallen during recent years, this decline has been much greater in urban than in rural communities. He then discussed the economic and vital loss due to malaria and typhoid, showing that these two diseases alone cost the United States over $900,000,000 each year, and that both diseases are almost entirely preventable. Comparing the 1915 appropriation for the prevention of human disease with that for the prevention of diseases of animals, Senator Randsdell called attention to the fact that the total amount appropriated last year for human welfare was less than two million dollars, while the amount appropriated for animal and plant welfare was nearly six million. "The problem of rural sanitation," he declared, "is not a local problem, but one which concerns the health and physical integrity of our entire nation." Senator Randsdell's speech in favor of the passage of his bill is one of the strongest public health utterances ever made before Congress. While the bill is simple in its phraseology and provisions, its passage would result in widespread and lasting benefit to the entire country, and would greatly strengthen the Public Health Service. If Congress will pass this measure, it will deserve the gratitude and thanks of the public and especially of our rural population.—*Journal of the American Medical Association.*

A COMPARISON OF BACTERIOLOGICAL METHODS FOR THE EXAMINATION OF OYSTERS.

CARLETON BATES and LESTER A. ROUND,
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Read before the Laboratory Section of the American Public Health Association, Rochester, N. Y., September 10, 1915.

BACTERIOLOGICAL studies of shellfish, especially oysters, have received considerable attention from bacteriologists during the past twenty years. During this time considerable advance has been made in our knowledge of the biology and bacteriology of this important food. So important was the question from a sanitary standpoint that the American Public Health Association, through its Laboratory Section, appointed a Committee to consider "Standard Methods of Shellfish Examination." The report of this committee was published in August, 1911.* This was a preliminary report and presented tentative methods of procedure for the examination of shell and shucked oyster stock. Briefly the method as proposed for the examination of shell stock included the collection of twelve oysters with deep bowls, short lips and shells tightly closed; this sample to be properly packed and transferred to the laboratory for examination. The examination included the determinations of the total numbers of bacteria and B. coli per cubic centimeter of the shell liquor.

The Second Progress Report of this Committee† was substantially the same as the Preliminary Report except that the recommendations included the total bacterial count upon a composite sample obtained by mixing the shell liquors of five oysters which had previously been examined individually for B. coli. The determination of the total count was to be made in accordance with the procedure of the Standard Methods of Water Analysis of the American Public Health Association.

The "Standard Methods" in outlining the method of determination for shucked stock recommended in the preliminary report:

1. The holding under refrigeration of the sample for twenty-four hours before the examination was made.

2. The procedure for bacterial counts to be the same as for shell stock.

3. The determinations for B. coli to be the same as for shell stock except that dilutions higher than 1/100 cc. are recommended.

For the Second Progress Report of the Committee on Standard Methods of Shellfish Examination, a modification of the first point is recommended, namely, that:

1. The sample should be examined immediately instead of holding for twenty-four hours.

In both reports it is stated that in the examination for B. coli higher dilutions should be used in shucked stock than in shell stock. B. coli do not

*AMERICAN JOURNAL OF PUBLIC HEALTH, Vol. II, No. 31, 1912.

†AMERICAN JOURNAL OF PUBLIC HEALTH, Vol. II, No. 34, 1912.

grow in oysters under the ordinary conditions of handling in the oyster house or during transportation, if properly iced. This is recognition of the fact that, volume for volume, there are more B. coli on the body of the oyster than are contained in the shell liquor, a fact which one of us (Round)* has shown.

In the examination of the shell stock the shell liquor is employed, whereas in the examination of the shucked stock the mucus which comes from the oysters after standing is used. Consequently, the examination of shell and open stock from the same lot will not give results which can be compared, due to the fact that the examination is made upon different material.

The method outlined by the Committee has been followed by practically all workers upon the shellfish question with certain changes or modifications of the method according to the ideas of the individuals. Perhaps the most variable point in the use of the method is the size of the sample employed by different investigators. In some cases five oysters only have been used in the sample whereas in many other cases multiples of five have been employed. When multiples of five are employed the shell liquors of two or more oysters are mixed and the composite sample examined as for a single oyster, the rating on the sample then being recorded as for five individual oysters. Owing to the variation in the analysis of single oysters from the same lot, the results obtained from different workers also varied.

For the purposes of experimental investigation the writers have developed a method of examination which has to do with the meat or body of the oyster. It is believed that in view of recent work upon the bacteriology of the oyster the results obtained by the present standard methods are not comparable and do not give reliable data for experimental investigations in which it is necessary to compare the bacterial content of oysters before and after shucking and at various stages of the handling and during transportation and storage. One of us (Round)† in his work for the Rhode Island Shellfish Commission has shown the relation of the numbers and kinds of bacteria upon the body of the oyster to the numbers and kinds in shell liquor.

His work tends to show that during the winter months, which is the active season for the oyster industry, the total number of bacteria of the B. coli type in the shell liquor and the total number found upon the body of the oyster are about equal. But during the summer months, which include September and October, the first two months of the oyster season, when the oysters are more actively secreting mucus, there are in general many more organisms of this type on the body of the oyster than are to be found in the shell liquor.

For an investigation of the change in bacterial content during handling

*Round, L. A. Contributions to the Bacteriology of the Oyster. State of Rhode Island and Providence Plantations as Authorized by Commissioners of Shell Fisheries of the State of Rhode Island, 1914. Also Comparative Bacteriological Examination of Shell Liquor and Meats of Oysters, Jour. Am. Pub. Health Assn., July, 1916.

†*Loc. cit.*

and transportation the writers devised the following method:

Preparation of the Sample.—The collection and the handling of the sample was in accordance with the present recommendations of the "Standard Methods" except that the sample included at least thirty oysters.

Washing the Oysters.—Each oyster was scrubbed thoroughly with a stiff brush in running tap water. Immediately after washing, the oysters were placed in a wire basket, hinge end down and allowed to drain until the shells were practically dry.

Opening the Oysters.—If the oysters had not drained sufficiently so that the shells were practically dry, the excess liquor was removed by a clean dry towel. When ready for examination an oyster was held by the hinge-end between the thumb and fore finger and the lip of the shell flamed with a bunsen flame or burned off with alcohol. The opening was done with an oyster knife, previously sterilized by burning with alcohol.* Care was taken not to mutilate the oyster meat.

Draining the Oyster.—Immediately after opening, the oyster was carefully shucked into a sterile, specially constructed container, so arranged that the liquor drained into a sterile receptacle. Care was taken at the time not to allow any of the liquor to be lost. The oysters were allowed to drain ten minutes before starting the examination.

Examination of the Shell Stock.—To 200 cc. of the drained oyster meats, opened as described, an equal volume of 1 per cent. sodium chloride solution was added. The oysters and salt solution were shaken vigorously fifty times. Twenty-five cc. of the liquor was removed into a sterile glass-stoppered bottle and again shaken fifty times with the addition of sterile glass beads or shot. The liquor thus obtained was examined by using five separate portions, conducting the examination for the total bacterial count by plating upon nutrient agar and incubating forty-eight hours at 37° C. and a duplicate set of plates at room temperature. Five separate portions of the liquor were examined for the presence of gas-producing organisms in ox-bile fermentation tubes. Colon types of organisms were confirmed by the use of Endo's medium.† The results thus obtained from the confirmed colon examination were scored upon the basis of five oysters.

Examination of the Liquor from the Shell Stock.—The liquor obtained after shucking and draining the oysters was placed in a sterile jar and vigorously shaken fifty times with the addition of sterile glass shot or beads. Twenty-five cc. of the liquor were removed into a sterile glass-stoppered bottle and an equal volume sterile 1 per cent. salt solution added, and the whole shaken vigorously fifty times with the addition of glass shot. The examination was then conducted the same as for the liquors obtained in the examination of

* The opening of an oyster can be facilitated by holding the oyster firmly on the edge of the bench with the deep bowl down and inserting the knife from the edge. Care should, of course, be taken not to let the edge of the shell where the liquor is to run out come in contact with anything except the sterile oyster knife.

†Kenyoun, J. J. and Deiter, L. V. On the Preparation of Endo's Medium. Am. Jour. Pub. Health, Vol. II, No. 12, p. 979.

the washings from the meats, making five determinations and scoring as above, the results thus obtained denoting the number of bacteria present in 1/2, 1/20, and 1/200 of a cubic centimeter. These results were changed to score upon the basis of one cubic centimeter by multiplying by two.

Examination of Shucked Stock.—Freshly shucked stock, as obtained during the process of handling in the oyster house, was drained for ten minutes in the specially constructed container and treated as described for the examination of meats under shell stock. Shucked stock from the commercial package was examined without draining. The liquor from the commercial package was examined as described for the shell liquor under shell oysters.

During the past oyster season this method was employed in the examination of commercial shipments of shucked oysters, in which examinations were made at various steps in the preparation of the shucked oysters for the trade. The results obtained will be fully discussed in another paper.* In these experiments as conducted, shell oysters were examined as the first step of the routine. In using the above method, a composite sample of the shell liquor was obtained at the start. Five individual portions of this shell liquor were then examined and the score computed in the same manner as for the present "Standard Methods." The scores which were obtained, therefore, would conform to the scores which would have been obtained had the examinations been made according to the present "Standard Methods." From time to time additional determinations were made on shell oysters from the same lot using the present "Standard Methods."

These results have been tabulated to show the relation between the two methods:

COMPARISON OF RESULTS OBTAINED BY METHOD DESCRIBED AND BY "STANDARD METHODS" ON THREE SAMPLES OF SHELL OYSTERS.

Sample No.	Method Described.						Standard Methods.		
	Washings from oyster meats.			Oyster liquor.					
	Count after.		Confirmed B. coli score.	Count after.		Confirmed B. coli score.	Count after.		Confirmed B. coli score.
	4 days at 25° C.	2 days at 37° C.		4 days at 25° C.	2 days at 37° C.		4 days at 25° C.	2 days at 37° C.	
1	700	95	1	1,825	375	4	1,600	75	23
2	5,200	275	2	17,500	500	6	6,000	240	5
3	180	35	3	975	50	10	1,400	100	14

NOTE: All counts are the average of five determinations.

* Bates, Carleton. The Handling of Shucked Oysters. Read before the Laboratory Section of the American Public Health Association at the Annual Meeting, Sept. 7–10, 1915.

A COMPARISON OF RESULTS OF THE BACTERIOLOGICAL EXAMINATION OF THE SHELL LIQUOR AND THE MEATS OF OYSTERS BY THE METHOD DESCRIBED.

Sample No.	Washings from oyster meats.			Oyster liquor.		
	Count after.		Confirmed B. coli score.	Count after.		Confirmed B. coli score.
	4 days at 25° C.	2 days at 37° C.		4 days at 25° C.	2 days at 37° C.	
4	2,200	450	1	1,930	430	0
5	460*	30*	5	7,550*	96*	10
6	3,000	13,500	50	3,250	1,650	100
7	1,450	23†	0	1,750	70	6
8	60	28	0	370	65	6
9	1,450‡	240‡	0	14,400‡	60‡	2
10	8,000	225	23	80,000	460	46
11	1,500	95	3	7,700	320	10
12	700	95	1	1,800	290	4
13	6,150	80	1	3,500	350	6
14	5,100	275	2	17,500	500	6
15	3,700	300	0	1,650	870	6
16	45	12	5	1,100	390	4
17	180	36	3	970	50	10
18	430	140	1	4,750	420	46

* Average of 2 determinations.
† Average of 3 determinations.
‡ Only one determination made.
NOTE: Unless otherwise stated all counts were the average of 5 determinations.

From these tabulations, it can be noted that although the total numbers of colonies developing from the samples vary between the meats and the liquors, the variation in the B. coli score was not great.

The container used in the determinations consists of a basket constructed to hold exactly 200 cubic centimeters of oyster meat. This basket allows the liquors to drain into a cylinder. The basket and cylinder are made so that the basket will set into the cylinder without touching the sides and so as to permit a cover for both. The whole container can then be sterilized so that the oysters can be shucked into the sterile basket and drain immediately into the sterile container. An illustration of the container follows.

Previous work had convinced us that the present "Standard Methods" were not adapted to experimental investigations in which it was necessary to follow the change in bacterial content of the oysters from the time they left the beds, through the various steps in handling in the house, and during transportation, for the reason that the substances examined during the various steps were in no way comparable. During the washing process

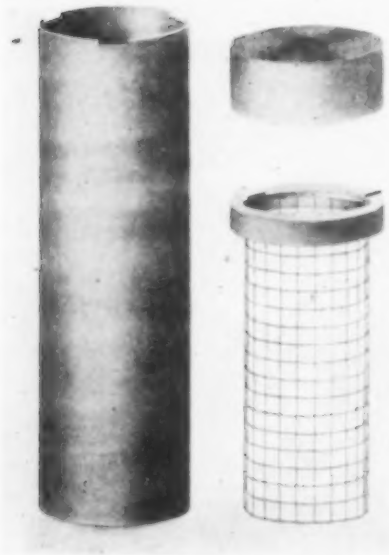

Illustration showing cylinder, basket and cover used for draining the oyster meats. For description see text.

the oysters entrap a considerable amount of water which is readily given off if the oysters are allowed to stand a few minutes in a closed vessel. This is little more than wash water. On the other hand when the oysters are put into the commercial package they are thoroughly drained, and whatever liquor collects after the oysters are left over night in a refrigerator is mucus from the body of the oyster. For these reasons it is readily seen that a standardization of the substance examined and the method of examination is essential in investigations like the one mentioned above.

This method is applicable to the examination of oysters, either shell or shucked, at any time during handling or during shipment, and enables one to make comparable determinations. This point is shown more clearly in another paper.*

*Bates, Carleton. The Handling of Shucked Oysters Read before the Laboratory Section of the American Public Health Association at the Annual Meeting, Sept. 7-10, 1915.

THE PRUDENTIAL INSURES ITS EMPLOYEES.

The largest amount of life insurance ever written at one time was issued recently by the Prudential Life Insurance Company of America. All employees of that corporation throughout the United States and Canada got life insurance policies without any cost to them. The total amount involved is more than $16,000,000.

All employees were insured according to the length of their service, no policy being less than $500 or more than $2,000, without regard to age or position, with the one exception that the company's gift does not include any of its officers or directors. No employee was compelled to submit to any medical examination.

The Prudential is the first of the great insurance companies to insure its staff so liberally. The action follows a service disability and retirement plan for the company's employees, which has been in operation for some time.

In announcing this bonus to its employees President Dryden issued a statement in behalf of the company which read in part:

"The plan should not be regarded as taking the place of any personal insurance which the employees of the company may wish to carry. It does, however, render it possible for such employees to say to those whom they hold dear that the company's interest in their welfare insures, in the event of death, the payment of a sum sufficient to permit adjustment to the changed conditions."

OTHER FACTORS IN INFANT MORTALITY THAN THE MILK SUPPLY AND THEIR CONTROL.

GRACE L. MEIGS, M. D.,
Washington, D. C.

Read before the Public Health Administration Section of the American Public Health Association, Rochester, N. Y., September 10, 1915.

Dr. Meigs is connected with the Children's Bureau of the U. S. Department of Labor. In this paper she reviews some of the methods of attack which have been employed with success in dealing with the infant mortality problem.

INFANT welfare work is no longer a novelty or an experiment in public health work. It is no longer a necessity for speakers on this subject to urge its importance; nor is it necessary to discuss the fundamental principles upon which this work must be carried on. I am going to take it for granted, then, that every one here is convinced that no public health work is more important than the prevention of infant mortality. Beyond this I am going to take it for granted that we are agreed upon the lines of work which the prevention of infant mortality must take. Those early infant welfare campaigns which were directed almost exclusively against impure milk accomplished great things; the campaigns of today, however, have shown that we must attack many other factors in order to reduce the infant mortality rate of a community.

The essential features of all campaigns in all communities, upon which I believe we are agreed, are these:

1. The first in importance is the education of the mother and the mother of the future in the care of herself and her baby, above all with regard to the advantage of breast-feeding.

2. Another essential is an exact knowledge in each community of the facts of the infant mortality of the community, which is obtained only through accurate birth and death registration; with a knowledge of the most frequent cause of death and a realization of the parts of the community where the mortality rate is the highest.

3. The third is a pure milk supply.

4. The fourth is the betterment of such civic, social and economic conditions as are hazards to the lives of the whole family, but especially to the life of the baby.

Dr. Holt has well summed up infant mortality as having two fundamental causes: Ignorance and poverty. Ignorance we can and must cure; poverty we cannot cure by public health measures, but we must include in our programs the protection of the poor from the community evils that are associated with poverty. By the means that I

have indicated above in outline are attacked the three great groups of causes which together are responsible for about three-quarters of the deaths of infants under one year.

The diseases of diarrhea and enteritis are those which are commonly thought to cause the most deaths, and are in reality second, claiming about 25 per cent.*

These are the diseases which are largely preventable. I have no desire to plunge you into the controversy which has raged for some years around the subject of the immediate cause of the summer diarrhea of infants, whether it is an infectious disease spread by milk, water, flies, or contact; or a disease due to poisonous substances in impure milk, or one due largely to the lessening of the baby's vitality by the action of hot weather, intensified by hot overcrowded rooms, and too thick clothing. It may be concluded for our purpose that all these factors may and do cause infant diarrhea, and that the efforts to prevent this disease must be directed against all these causes through the education of the mother. She must be taught above all the importance of breast-feeding; also the means of protecting the baby from infection as carried by flies, conveyed by the hands or transmitted through impure milk. She must know the proper care of the baby in hot summer weather with regard to proper clothing, bathing and the ventilation of the home.

2. The congenital diseases and diseases of early infancy claim the largest number of deaths. About one third of the deaths of babies under one year are due to these causes. No more than a guess can be made as to the degree to which these diseases can be prevented; the definite effort to prevent them is that phase of infant welfare work claiming great attention at present. Two problems are here involved: (1) The ignorance of the prospective mother in the care of herself during pregnancy; (2) Improper care by physician and midwife during pregnancy and at birth.

The experiments carried on in New York City and in Boston have proved beyond doubt that through education and care of the prospective mother reduction can be made in the death-rate from these causes. The wonderful growth of this prenatal work proves that every one is convinced of the importance of work along these lines. The Children's Bureau has, during the past year, been gathering information with regard to all forms of infant welfare work being carried on in this country; we have records of prenatal work now being done in about 110 different localities.

3. The third group of diseases, those of the respiratory system, cause about one seventh of all the deaths under one year. This element of the death-rate is very difficult to touch; the definite

* Figures compiled at the Children's Bureau from the tables published by the United States Census Bureau give the following percentages as due to each of the three causes. These percentages are based on the average annual number of infant deaths for the five year period 1908-1912 and relate to the states which were in the death registration area in 1910: Diarrhea and enteritis, 25.6 per cent.; congenital diseases and diseases of early infancy, including congenital malformations, congenital debility and premature birth, atrophy and marasmus, injuries at birth, and other conditions peculiar to early infancy, 34.8 per cent.; respiratory diseases, including acute bronchitis, broncho-pneumonia, and pneumonia, 14.9 per cent.

attempt to reach it is the development of only the last few years. The New York City and State Departments of Health have this year especially attacked this problem. Here, too, the chief weapon is the education of the mother. She must be taught that breast milk and plenty of fresh air protect against these infections; that the baby must not be exposed to infection from a person suffering with a cold; and that respiratory infections in the baby must receive early treatment.

The teaching and direction of mothers who need such help in the care of their babies is, then, the chief problem at which infant welfare work centers.

I shall take for granted that we are all agreed on one more point—that efficient teaching and direction of the mother can best be accomplished first by the help of a visiting nurse, who shows the mother, preferably in her own home, how to care for the baby, and how to prepare his food if he is bottle-fed; and second, by the advice and direction of a physician, preferably at an infant welfare station, where conferences between mother, physician and nurse are held, and the baby is weighed at frequent intervals. All general methods of education by pamphlets, bulletins, lectures, newspaper articles, exhibits, contests, conferences and baby weeks are only supplementary to the work of the nurse and the infant welfare station. These two units are the essential factors in all infant welfare campaigns.

During the study of the past year made by the Children's Bureau into infant welfare work being carried on in this country, letters were sent to public health officials and the heads of private organizations doing infant welfare work in all towns having over 10,000 inhabitants. We have received answers up to the present time from 527 cities. Of these 127 report that infant welfare stations are maintained; in 27 by the city department of health; in 8 more by municipal and private agencies in coöperation; in the remainder by private organizations alone. City departments of health are to a greater degree carrying on infant welfare work through instruction by visiting nurses, in many cases in connection with general nursing work. Sixty-six departments of health have reported such work; 8 more carry it on in coöperation with private organizations; 33 more have reported some work, which has not, however, been verified by a complete report. On the other hand, 264 private organizations are doing instructive nursing work in the care of babies. The history of infant welfare work in most communities is that it is begun usually by private organizations; after the need for it and the possibility of carrying it on successfully have been demonstrated, the work is taken over by the city health department. In many cities, as the figures I have given show, this taking over by the health department has not yet occurred.

A very successful branch of education in the care of babies is that given in the little mothers' leagues. These, as you know, were first organized in 1908 in New York City. This year the *Health News* tells us there are 200

leagues with 30,000 members in the public schools in New York City. The movement has spread to the rest of the country. The Children's Bureau has record of work in 73 cities in the instruction of young girls in the care of the baby. These leagues, which are self-governing bodies of school girls of the higher grades, receive instruction given by school physician, nurse or teacher. The results are very good. Many of these girls inevitably have the care of their little brothers and sisters in summer and need only too pitifully some instruction in how to care for them; in addition the girls are prepared for the time when they will take care of babies of their own. Without doubt, too, through these girls a strong educational influence is exerted over the whole family.

The value of all the general forms of education in infant care—pamphlets, bulletins, exhibits, is hard to measure. Some mothers, especially the ignorant foreign-born, and those needing help most of all, can be reached but very little, if at all, in these ways; upon them the visiting nurse and the infant welfare station alone exert any influence. There can be no doubt, however, that in a broad general way the influence of all that is written and said about the baby is enormous. This field of education is that which is open to the State Departments of Health. Two of these, New York and Kansas, have divisions of Child Hygiene; Ohio is organizing such a division; Massachusetts and Louisiana have branches of the State Department giving attention to the subject. We have found that twenty-three state boards of health distribute pamphlets or bulletins on the care of the baby, many of them sending them to each mother the birth of whose baby is registered. Fourteen states include in their newspaper press service articles on the care of the baby. In many states having state health exhibits, a portion of the space is given to exhibits on infant welfare in Louisiana and Texas; these are shown in the health exhibit cars which travel over the state. In many others, the exhibits are sent about the state, and are frequently shown at county fairs. Many states have lecturers on the subject of infant hygiene.

The New York State Health Department has combined a general educational campaign in infant welfare through traveling exhibits with the specific effort to encourage the establishment of local organizations to maintain infant welfare nurses or infant welfare stations. The remarkable success of the campaign of last year, when the number of localities having stations in the state outside of New York City was increased from 12 to 32; and the number of stations from 32 to 67, will probably lead to similar campaigns in other states.

The extension departments of the Universities are doing a great deal of educational work in infant care; as are also the home ecomonics divisions of the extension departments of the agricultural colleges. The latter, through whom federal money is expended for extension work in rural communities in coöperation with the Department of Agriculture, reach more

than any other agencies the women in the country. These departments are realizing the importance of teaching the care and feeding of babies and children, and are teaching these subjects through lectures and exhibits in their farmers' institutes, at short courses and at county fairs.

A new form of educational publicity with regard to the baby is the baby week which has been held recently in several cities in this country; in some cases with the purpose in addition of securing money for infant welfare campaigns. The first baby week was held in Chicago, April, 1914. It was planned by a committee of advertising men and women who donated their services, and the object was to obtain funds for the Infant Welfare Society. The advertising was done in many ways. A famous sculptor made a bust of mother and child, casts of which were exhibited everywhere, while pictures of it were shown on the posters. Billboard men gave space for posters, newspapers ran display articles, coupons were inserted in theater programs, signs were exhibited in all the street cars; slides were shown between films at the motion picture theaters, while films on milk and the care of the baby were shown. Milk dealers put special wrappers around bottles of milk sold during this week. A house to house canvass for money was made by a committee of women.

The New York Baby Week followed in June, 1914. This was not a campaign to raise money, but rather to educate the public with regard to infant welfare work. The same methods of publicity were used. Especial features were excursions for mothers, baby parades, and days devoted to visiting different types of baby-saving centers, such as infant welfare stations, day nurseries, and asylums.

This year the idea of a baby week has spread rapidly. Pittsburgh, Detroit, Yonkers, Indianapolis, Topeka, Staten Island, and Grand Rapids, among others, have held baby weeks, several of which have been carried on chiefly by the city departments of health. Each city has introduced new features; all have been an expression of the great interest now felt in babies. It is hoped that each will lead to permanent work for babies, to the employment of infant welfare nurses and to the establishment of infant welfare stations.

Before I stop I want to speak of the neglected field of infant welfare work in the country, and in small towns. Up to the present time very little has been done along these lines. Just now there is a growing realization that the need of people living in the country for work of this kind is very great. This is in harmony with the fast increasing interest in all the problems of rural health and sanitation. We have not, on account of our incomplete birth registration, a definite knowledge of the infant mortality rate in most rural districts, and its relation to that in urban districts. The evidence available tends to show that the rates are almost constantly lower than in urban areas; yet does not show that they are low enough to justify the general lack of effort. It is possible that the relative proportion of deaths

due to the chief causes mentioned before varies from that which has been given as holding true for the death registration area as a whole; for instance, the proportion of deaths due to gastro-intestinal diseases may be much less. The methods for doing successful infant welfare in the country are not yet worked out. The difficulties of establishing in the country infant welfare nurses and infant welfare stations are very great. An infant welfare station with weekly attendance by mothers is usually out of the question; the nearest approach would be a permanent station with periodic examination and weighing of the baby. Such a station at a small town or county seat, where a nurse is in attendance and mothers may come for instruction and for examination of the baby, is practicable. A station of this type is maintained by the Parents' Educational Bureau, at Portland, Oregon. At Binghamton, New York, a rest club has been established with comfortable quarters and a nurse in attendance, where country mothers coming into town for shopping may leave their babies. Here the work has been developed to include the weighing of the baby and conferences between mother and nurse with regard to the care of the baby. Direct instructive work in the homes by rural visiting public health nurses seems at present the best solution of the problem, supplemented by mothers' meetings, little mothers' leagues,etc. This work must necessarily be carried on in conjunction with other public health nursing work; with tuberculosis work, rural school and general educational work. The rural nurse cannot be a specialist. This is, however, in line with the present tendency pointed out by several speakers at these meetings against specialization in public health nursing in communities of all sizes. Many of the nurses of the Red Cross Town and Country Service are doing this infant welfare work with great success; traveling over their districts on horseback or in carriages, holding mothers' meetings, organizing little mothers' leagues in the schools, and teaching mothers the care of their babies in their homes, under the advice of the family physician.

In New Zealand the problem has not been dissimilar to that in many of our states with a largely rural population. The success achieved by the New Zealand Society for the Health of Women and Children, attested to by the fact that the infant mortality rate for New Zealand is one of the lowest in the world, is described in a small bulletin published by the Children's Bureau.* Local committees of this society are formed for small districts; the nurses of the society, each 8 in a district with a radius of about 50 miles, work through local committees, visiting each locality at stated intervals, holding meetings and conferences and visiting homes. Their work is supplemented by pamphlets and newspaper articles.

At least one County Child Welfare Society of rural women, that of Henry County in Iowa, has been formed. The association is made up from many

*New Zealand Society for the Health of Women and Children, U. S. Children's Bureau Publication, No. 1.

different women's organizations in the county, and has a purpose very similar to that of the New Zealand Society. This county society expects to work in close coöperation with the agricultural county agent.

The problem of the maintenance by rural districts of public health nurses forms part of the general problem of rural sanitation which awaits solution during the next few years.

Infant welfare work, like other public health work, has its special problems in the town and small city. Those problems are receiving much attention today; and there is evidence that infant welfare work is growing rapidly in the smaller towns. The recommendation of the Special Health Commission of New York State of 1913 was a wise one: That each town of over 10,000 inhabitants having an industrial population should support an infant welfare station and that larger cities with an industrial population should have one such station for approximately each 20,000 inhabitants. Of the one hundred and twenty-seven cities in the United States spoken of previously, which had infant welfare stations in 1914–15, forty-five had less than 25,000 inhabitants, and fifteen were under the 10,000 mark.

I believe and hope that in the next few years the development of infant welfare work in the country and the small town will be very great.

THE MIDWIFE.

The midwife is with us and in increasing numbers. She is not new to the old world. She existed in Egypt before the days of Moses. In the East and in Europe up to the middle of the sixteenth century all women were delivered by midwives. In the seventeenth century schools were established for their special training and in the past fifty years they have, on the continent, been under state control; in most European countries a thorough training is required, which sometimes covers a period of two years. In at least one country, Holland, midwives or a certain number of them, are taught at the expense of the state, in order that they may better serve the people of the rural regions.

Some of our own states hold examinations and have certain requirements of training, and in at least one city, New York, there is an excellent school for midwives. Since they are likely to become more and more a part of our national life, it behooves all our states to be alive to the need of seeing that the midwife in her line comes up to as high a standard of excellence as is demanded of the physician and that she has ample opportunity for the best of training.

The midwife fulfills a want among the poor, and cannot be replaced by the physician, for she is doctor and nurse combined and gives her services in both capacities at a price lower than the doctor can afford to charge.

It is not to be wondered at, therefore, that in some of our cities a fourth of the children are born into their hands. As with physicians, there are good and bad midwives, well trained and ill trained, experienced and inexperienced, yet, in comparison with the physicians, their work seems not to suffer, for statistics of one of our American cities show that of the cases of puerperal infection, about half occurred in the women delivered by physicians and half in those attended by midwives. These figures should obviously be judged in the light of the character of the clientele of the two classes of practitioners, for those assisted by the midwives are undoubtedly more immune to infection, but, nevertheless, considering the amount of her training, the midwife stands the comparison well. Doubtless too frequent interference with the course of nature—meddlesome midwifery—on the part of the doctor has much to do with this statistical reproach.—*New York Medical Journal.*

MILK CLARIFIERS.

CLARENCE BAHLMAN,
Chief Chemist, Cincinnati Department of Health.

CONSIDERABLE data has been published covering studies on the pasteurization of milk. The mechanical construction of the various types of pasteurizers and the principles and results of the process are well known to public health workers.

Recently dairy-supply houses have placed the so-called milk clarifiers or milk separators upon the market. The claim is made that these machines remove filth from milk, and one is led to believe that a great reduction in bacteria is also accomplished.

A search through scientific periodicals fails to reveal any data covering bacteriological or chemical studies upon milk clarifiers. The Cincinnati Department of Health recently has had an opportunity to make such investigations, and the results seem to justify publication.

Milk clarifiers are, essentially, large centrifugal machines, capable of continuous operation at high speed. Machines of different manufacturers vary in mechanical details, but the principle governing all is the ability to throw out suspended matter from liquids by means of centrifugal force.

Our tests were made upon a clarifier driven by a steam turbine at 7,000 revolutions per minute. Eight samples of raw milk and the corresponding milk after passage through the clarifier were plated out for total bacterial content by the standard methods of the American Public Health Association, with results shown in the following table:

Test Number.	Bacteria per cc.		Per cent. increase in Bacteria.
	Raw.	Clarified.	
1	630,000	750,000	19
2	900,000	980,000	9
3	1,400,000	1,800,000	28
4	455,000	730,000	60
5	418,000	580,000	39
6	3,150,000	4,005,000	27
7	2,160,000	2,800,000	30
8	1,380,000	1,726,000	25
Average	1,312,000	1,670,000	27

The increase in bacteria is to be accounted for by the breaking apart of clumps of bacteria by the violent mechanical action taking place in the machine. The counts obtained upon the raw milk represent, to a large degree, bacterial aggregates which cannot be broken apart by merely shaking the sample before plating. Counts upon the clarified sample represent individual organisms, at least to a great extent. Thus a clump of bacteria in the raw milk will be counted as one organism, while in the clarified product the members of the clumps are counted as individuals.

The milk used in the test was cold,

and the time exposed to centrifugal force did not exceed a few seconds. This excludes all possibility of propagation, and, since large numbers of bacteria are found in the deposit in the clarifier, it follows that in reality there is some removal of bacteria by the process. Bacteria in liquids are acted upon very slowly by gravity, and adhere, in the case of milk, rather tenaciously to the fat globules. It seems then that we cannot expect any great percentage reduction, as the milk is exposed to the separating force for only a few seconds.

Fifteen cubic centimeter portions of the samples were centrifuged in the laboratory for three minutes at 3,000 revolutions per minute. A white sediment was deposited in the bottom of the centrifuge tube in all samples. In all cases this deposit merely covered the apex of the tube and could not be measured, although the raw milks showed slightly more residue than was obtained from the clarified milks.

The appearance of sediment when centrifuging the clarified milk in the laboratory, at a lower speed but for a longer time than at the bottling plant, indicates that all matter capable of being thrown out of milk is not completely removed by the clarifier. In the removal of bacteria by centrifugal force or gravity, a great force momentarily applied will not accomplish as much as a lesser force acting for a longer time.

The ordinary sediment test, in which pint samples of milk are filtered through cotton disks, was applied to these samples. The raw milks showed the usual residue of short hairs, dust, etc. The clarified samples were entirely free from visible suspended impurities. These machines, therefore, completely remove all gross suspended dirt from milk.

The sludge or residue in the clarifier is a grayish mass of unsightly appearance. The material deposited immediately next to the centrifugal bowl is dark gray, very rubbery and tenacious, and drier than the upper layers, which are light gray slimes. The layers are not sharply defined, but the difference between the lower rubbery layer and the upper white, almost fluid layer, is very marked.

Examinations of representative portions of the sludge showed:

Moisture	60.0%
Solid matter	40.0%
Bacteria per gram	950,000,000

Microscopical examinations of stained smear preparations showed that amorphous matter having no definite structure greatly outnumbered the cells and organisms. Bacilli, cocci, streptococci, epithelial and pus cells were present, but no acid-fast bacilli were found.

The sludge, after being dried and pulverized, showed:

Organic matter	85.36%
Mineral matter	14.64%

The dried powder was then subjected to systematic chemical analysis, with the following results:

Chemical Analysis of Deposit in Milk Clarifiers.

	Per cent.
Protein (Nitrogen x 6.38)	67.9
Fat	3.4
Milk sugar	7.8
Crude fiber	2.2
Silica	3.8

	Per cent.
Oxide of iron	0.5
Oxide of alumina	0.6
Calcium phosphate	3.6
Potassium phosphate	6.2
Sodium and potassium chloride	0.1
	96.1
Undetermined	3.9
	100.0

In the analysis, the silica and oxides of iron and alumina are weighed after ignition at red heat, while in the original sample they exist in hydrated form, so that the mineral matter as reported above is somewhat lower than the true amounts. The factor used for calculating the protein assumes that the nitrogen found by analysis is 15.7 per cent. of the protein molecule. If the proportion of nitrogen was less than this, then the percentage of protein stated above, 67.9 per cent., is too low. In this way, the undetermined matter is largely accounted for.

Tests indicate that the fat found in the sludge is only partly milk fat, the remainder being fat which originates from epithelial cells and other organic detritus.

The silica and oxides of iron and alumina are elements entirely foreign to milk. They are to be accounted for by the presence of earthy impurities, such as dust and sand from the soil.

The protein undoubtedly consists largely of casein, which exists in milk in combination with calcium phosphate. Not being in perfect solution, it tends to be deposited by centrifugal force. The phosphates, milk sugar, and chlorides are also normal constituents of milk.

It seems, then, that the residue in the clarifier consists very largely of substances normally present in milk. Presumably the very best product would show a similar deposit. We passed several gallons of fresh certified milk through a small clarifier, operated by hand, and obtained a thin deposit of grayish slime.

The weight of material deposited in the clarifier from 725 gallons of milk, was 2½ pounds. As an average, then, one gallon of milk yielded 1.6 grams of moist sludge, equivalent to 0.6 grams of dried material.

Conclusions.

The clarifier completely removes from milk all coarse suspended dirt and impurities.

The material deposited in the machine contains large numbers of bacteria. It is our opinion, however, that no great percentage removal takes place, since the time during which the milk is exposed to the separating action is of very short duration; nor is there a complete deposition of all matter capable of being thrown out by centrifugal force. The seemingly greater number of bacteria in the clarified milk is due to the breaking apart of clumps of bacteria by the mechanical action.

The residue in the clarifier consists very largely of substances normally present in milk. Clean fresh milk from healthy cattle will yield a deposit when passed through the clarifier.

It is an exaggeration to consider the material deposited in the machine as consisting entirely of filth. Milk containing pathogenic organisms is prac-

tically no cleaner from the health standpoint after clarification than before. Milk depots handling large quantities of milk find that the removal of suspended matter by means of cloth or cotton filters is cumbersome and unsatisfactory. For such plants, the clarifier is an admirable installation for the speedy and complete removal of sediment. We must not, however, consider the clarifier as in any way a remedy for faulty conditions at the source of supply, nor as a substitute for pasteurization.

MULTIPLE PROTECTION BY VACCINES.

For those visiting or residing in localities in which epidemics are present, or in countries where certain diseases are endemic and sanitary supervision is questionable, protection against a number of diseases is much to be desired. Experience with vaccines has demonstrated the possibility of conferring a degree of immunity to a considerable number of diseases. A recent report by Dr. Aldo Castellani suggests that contemporaneous protection against a number of diseases may be conferred upon an individual by the use of several vaccines at one time without any greater inconvenience than is caused ordinarily in being vaccinated to secure protection against one disease. Doctor Castellani's article was published in the report of the Advisory Committee for the Tropical Diseases Research Fund for the year 1914, recently issued. His conclusions are summarized as follows:

I. The preparation of combined vaccines is based, I think I may venture to say, on the experimental work I carried out in 1901–2 in Bonn, in Professor Kruse's Institute (Zeit. für Hygiene, 1902–3), when I demonstrated that in inoculating an animal with two or three species of bacteria, provided a sufficient minimum quantity was given, agglutinins and immune bodies for all the germs were elaborated, the amount of agglutinins and immune bodies elaborated for each germ being nearly the same as in animals respectively inoculated with only one species.

II. I have prepared and used in man the following vaccines:

(1) Typhoid — paratyphoid A — paratyphoid B.
(2) Typhoid—Malta fever.
(3) Tyhpoid — paratyphoid A — paratyphoid B—Malta fever.
(4) Typhoid — paratyphoid A — paratyphoid B—B. asiaticus—B. columbensis.
(5) Typhoid — paratyphoid A — paratyphoid B—B. asiaticus—B. columbensis—Malta fever.
(6) Typhoid — paratyphoid A — paratyphoid B—dysentery Kruse-Shiga—dysentery Flexner—dysentery Hys Y—dysentery Flexner-like No. 1—dysentery Flexner-like No. 2.
(7) Cholera—plague.
(8) Cholera — plague — typhoid — paratyphoid A—paratyphoid B.
(9) Cholera — plague — typhoid — paratyphoid A — paratyphoid B — Malta fever.

III. The inoculation in man of the above combined vaccines is harmless. The reaction is not severe, with the exception of those containing plague germs, such as the "cholera-plague" and "cholera-plague-typhoid-paratyphoid A-paratyphoid B" vaccines, when the reaction is severe, though apparently rather less so than after Haffkine's simple plague vaccine.

IV. The combined vaccines I am now using consist of carbolized emulsions of agar cultures in normal salt solution without heating. These emulsions seem to give a less painful local reaction than broth cultures killed by heat. The presence of 0.5 per cent. carbolic acid is sufficient to kill the germs. The "typhoid-paratyphoid A-paratyphoid B" vaccine is, however, also prepared by heating broth cultures at 53.

V. The individuals inoculated with the above-mentioned combined vaccines generally produce agglutinins for each species of bacteria, and the amount for each species is not much less than control individuals inoculated with simple "one disease" vaccines. The only exception, though only to a certain extent, seems to have been in the case of typhoid dysentery vaccines.

VI. Combined vaccines, when efficient, are of practical advantage, saving a great deal of time and rendering possible a contemporaneous vaccination for several different maladies.—*Medical Officer*, London.

FUNDAMENTAL DISTINCTIONS BETWEEN LARGER AND SMALLER CITIES IN HEALTH ADMINISTRATION.

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Commissioner of Health, Rockford, Illinois.

Read before the Public Health Administration Section, American Public Health Association, Rochester, N. Y., September 8, 1915.

Large health departments, like large industries, are able to employ specialists to care for various details of their work. The small city health officer must often do the things that are done by a half dozen different people in the city. Doctor Park points out some of the important distinctions.

NO BETTER evidence of the great progress which has been made in the science of public health could be asked for than the fact that a paper with a topic such as the one which has been assigned me is up for consideration before so earnest-minded a body as the American Public Health Association.

It matters not how big or how little a health department may be, the ultimate result sought by every department is the same—the safeguarding of public health. While all departments, however, have this same object constantly in view, their problems of administration differ widely. Time was when the activities of the health departments of larger and smaller cities had very little in common, but in my opinion this condition has been changed and now we find a much broader spirit of coöperation and unity of purpose. Broadly speaking, then, our subject-matter may be put into one sentence in this wise: *The object sought for by every health department is universal, their differences in administration are local.*

The one greatest distinction between the larger and smaller health department is the influence on public sentiment which the larger department has constantly labored for. This influence has not been due to the police powers bestowed upon it by law; for the little department has the same sweeping authority, even if it may not always have the means of enforcement. True, the health commissioner of the larger city is perhaps more keenly alive to his legal rights, while the smaller town health commissioner often is ignorant of his power and sometimes unable to enforce the law through lack of public sentiment. The fact is, the big department has recognized the inestimable value of publicity.

Smaller cities have been and are handicapped by lack of proper appropriations, nor do I wish to be understood in this connection as saying that the larger cities are getting a proper

per capita appropriation. I believe it to be an indisputable fact that there is not a single city getting an appropriation adequate to meet its vast needs for public health administration. But the lack of proper appropriation is more significant in the smaller cities and is largely responsible for their inability to make any rapid strides in public health work.

A great many of the advances made in the larger cities are due to their ability to specialize in every branch of activity. In the smaller cities, without a proper staff of inspectors, the health officer, or his assistants, must spend much valuable time looking up impetuous complaints on barns, chicken coops, weeds, garbage and other nuisances, which as such are matters well within the jurisdiction of the police department. The varied duties of the small town inspectors absolutely will not permit them to specialize as in the larger cities. Your small town inspector has to spend his time not only on such complaints as I have referred to, but also in attempting to score dairies, milk depots, meat markets, grocery stores, restaurants, fish markets, fruit and confectionery stores. And when he has finished these duties, requiring more or less expert knowledge, he must collect samples of milk; samples of water; he must serve notices on unsanitary conditions in business and residence districts; investigate contagious and infectious diseases; place contagious diseases in quarantine and fumigate following contagion. As often as not the small town health inspector is asked to be a sort of special constable with a vigilant eye constantly open for law breakers and subject to call to police duty whenever a circus comes to town or at a holiday parade. With these varied duties to perform, the highest grade of efficiency and specialization are impossible.

Surface wells, vaults, cesspools and sewage, while they are problems to the larger city, are more so to the smaller one because of the limited extension of water mains and inadequate sewage systems. The smaller city's health commissioner is constantly called upon to convince stubborn property owners that the water from surface wells is not always good to drink no matter how pure it may look to the naked eye, which is about the only test that some wish to have applied.

While it has been unanimously agreed that the collection and disposal of garbage should be provided for from funds outside the appropriation of the health department, the smaller cities invariably have this burden attached to their budget. It is the stock argument of many aldermen of such cities that garbage affects the public health, and therefore is turned over to that department. The cost of garbage collection and disposal thus swells the smaller department's appropriation and often, in order to take care of it, the city fathers who preside over the destinies of the estimates of health commissioners' budgets, have to cut out items that are indispensable in actual health work. Thus, such items as estimates for laboratories, funds for bacteriological and chemical analyses, inspections, and funds for publicity work are ruthlessly slashed by the aldermanic pruning knife.

Ignorance and neglect, of course, are everywhere, but I think the smaller city's health official comes in closer contact with and has a harder battle to fight them down. There are in many American cities a certain aldermanic type who believe that when the swill has been removed and the yellow flag tacked up where the victim of contagion or infection lies dying, that the health department has performed its whole duty. This ubiquitous type of official does not realize that the important mission of the health department is to prevent disease rather than merely to flag its presence.

Unquestionably, the milk supply is one of the larger city's problems, in the handling of which it differs from the smaller one. The larger city must necessarily have its milk transported from a greater distance than the smaller city. Hence, for the larger city, pasteurization becomes more imperative. The smaller city, because of its proximity to its source of supply, can have a more complete supervision by scoring dairies, testing cattle and by enforcing its regulations for retail and wholesale milk dealers. There is absolutely no excuse whatever for an inferior milk supply in the smaller city. Every small city should have a rigid milk ordinance.

The campaigns of publicity that have been waged year in and year out in the larger cities have helped to spread enlightenment on public health questions. Good ordinances have resulted. But the best law ever written would be worthless without intelligent public sentiment behind it, and public sentiment must be gained slowly. Smaller cities often lose sight of this important fact. Such publicity as the little city undertakes is only too frequently lacking in human interest appeal, dramatic persistency and in policy. The lack of funds and public enlightenment is often the reason why the little city's health commissioner is unable to make a better showing. Think of all the work that may be done through the invaluable medium of publicity. For just one instance—the fact that consumption is a preventable disease and curable in its early stages, should not be said once, but must be reiterated a hundred, yes a thousand times, in order to drive it home to every citizen with sledge-hammer force. With God's free given sunshine and fresh air, with an abundance of everything that the incipient consumptive needs, still thousands perish annually in our country districts.

Stubborn ignorance and neglect and greed must be considered as in the same class and along with pathological bacteria. Fight them to the last ditch. On the other hand, public interest in its work is the strongest asset any health department can have. Such interest is won by spreading the truth concerning health facts. The work which has been done along these lines in recent years in the larger cities has had a far-reaching effect, and has been the inspiration, the guiding star, for the smaller cities. What progress has been made in the science of public health must be credited to the vast publicity campaigns undertaken by the larger cities.

They have disseminated knowledge and light in places where there was only darkness; they have armored themselves with the shield of courage and truth and fought the hard fight against the mammon greed; they have been the pioneers that have blazed the trail through the impenetrable wilderness of rank neglect. It is for the smaller city to study the ways of its bigger and stronger brother and good will come thereby.

THE DECLINING BIRTH-RATE IN ENGLAND.

Under the title of "The Declining Birth-Rate: Its Causes and Effects," the report of the National Birth-Rate Commission has been published in book form by Messrs. Chapman & Hall. The chief evidence taken by the commission is given as well as the report, the whole making a volume of 450 pages.

The report first examines the statistical information available through census returns and other sources and concludes that the following propositions are definitely established:

1. That the birth-rate has declined to the extent of approximately one-third within the last thirty-five years.

2. That this decline is not, to any important extent, due to alterations in the marriage-rate, to a rise of the mean age at marriage, or to other causes diminishing the proportion of married women of fertile age in the population.

3. That this decline, although general, has not been uniformly distributed over all sections of the community.

4. That on the whole the decline has been more marked in the more prosperous classes.

5. That the greater incidence of infant mortality upon the less prosperous classes does not reduce their effective fertility to the level of that of the wealthier classes.

The commission also consider that the following propositions, though based on less substantial evidence, are also sufficiently well established:

6. Conscious limitation of fertility is widely practised among the middle and upper classes, and there is good reason to think that, in addition to other means of limitation, the illegal induction of abortion frequently occurs among the industrial population.

7. There is no reason to believe that the higher education of women (whatever its indirect results upon the birth-rate may be) has any important effect in diminishing their physiological aptitude to bear children.

An additional report, signed by nearly all the members of the commission, points out one of the national dangers of restriction as it is at present practised: "The decline in the birth-rate at present is not eugenic, but dysgenic. Restriction prevails most in the classes in which the conditions of family life are most favorable, and the largest families are found under those conditions, hereditary, environmental, or both, which are most adverse to the improvement or even maintenance of the quality of the population."

So far as the decline is due to abortion, they say it is unhesitatingly to be condemned; and the use of mechanical and chemical preventives of conception injurious to health must also be censured. Some representatives of religion, however, make a reservation as regards methods not injurious to health. The signatories set out reasons why they consider an increase of the population desirable, so far as it is consistent with improvement. They point out that with more intensive culture of the land this country could satisfactorily support a larger population, and that this possibility is much extended if we take into account the whole British Empire. A number of proposals, many of them of an economic character, are also put forward for consideration as tending to further the object in view. They include a living wage, bonuses for families under certain conditions, relaxation of the income-tax arrangements, increased facilities for good education, adequate housing accommodation at reasonable rents, and measures to encourage the full development of natural resources both at home and in the Dominions beyond the seas.—*Medical Officer*, London.

SOME OBSERVATIONS ON HOMOGENIZED MILK AND CREAM.

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Read before the Laboratory Section, American Public Health Association, Rochester, N. Y., September 9, 1915.

HOMOGENIZING in the milk industry, in this country at least, has been a development of the last few years, but nearly all the large ice cream makers are already using the process. It is also used by the large creameries and milk dealers in various ways, as well as by the condensed milk factories. There are other actual, and probably many possible, applications of the principle.

For the most part homogenizing is done to secure some commercial advantage either through cheapening or improving the quality of the product, or the elimination of difficulties incident to customary methods, but there are some cases in which the process is distinctly fraudulent.

Milk and similar emulsions are homogenized by forcing them through extremely fine openings, under great pressure, with the result that the fat globules are broken up into fragments of such minute size that they are no longer capable of agglutinating together again. Hence no cream will rise to the surface of perfectly homogenized milk and no butter can be made from homogenized cream; neither can it be whipped or even separated in a mechanical separator. This practical result is in accordance with the statement of Professor Lindet of L'Institut National Agrominique, who has shown that the ascending force of fat globules in milk or cream is proportional to the cubes of their radii, and which is so feeble when the diameters are less than one or two microns that they no longer perceptibly rise in the form of cream.*

The history of homogenization is mainly French and dates back to patents taken out in 1892 for the emulsification of fats in the manufacture of oleomargarine.† Gaulin seems to have taken out the first patent for the homogenizing of milk in 1899 and his original idea was to fix the milk in such a way as to prevent the separation of the fat and partial churning into butter during standing and transportation and handling.‡

He endeavored to do this by forcing the milk through fine capilliaries; but without much success, largely because the smallest tubes he could make had a much larger diameter than the largest fat globules.

In 1902 he improved his invention by forcing the milk between two plane surfaces fitting closely together and held in position under high tension (approximately 3,000 lbs. per sq. in.). This is practically the machine as used today, although there is another also in use in which the milk is forced between steel discs clamped together on a steel core. The pressures on this machine are similar or somewhat higher.

The commercial possibilities of the process are extensive, but at present perhaps the ice cream industry is making more use of it than any other. It enables the manufacturer of this popular confection to make perfectly homogeneous mixtures out of heavy cream and either whole or skim milk, of cream and milk in which the butter has partly separated and which could ordinarily not be used for the purpose, and he can make perfectly good cream from fresh butter and skim milk or condensed skim milk, or even powdered skim milk and water. If he feels so inclined it is possible for him to use renovated or any grade of butter he chooses, oleomargarine, or any other foreign fat. All of these methods have doubtless been employed, but the use of fats other than butter has probably been very limited.

There is little literature to be found concerning the laboratory testing of homogenized products. So far as known the change produced is entirely physical. Milk and cream may be examined microscopically and, if well homogenized, the ap-

* Troude, J., *L'Homogeneisation du Lait*, Librarie Des Sciences Agricoles, Paris, 1911, p. 36.

† *Ibid.*, p. 40.

‡ *Ibid.*, p. 42

pearance is totally different from that of natural milk. When mixed with natural milk or cream detection is not so easy in this way but would probably become certain with experience. The separate examination of the top and bottom layers of mixtures, after standing, would probably give good indications.

VonSobbe defines the degree of homogenization of milk "as the per cent. of fat remaining in the lower 50 cc. of a 250 cc. sample of homogenized milk contained in a special cylinder and after standing at room temperature, preserved with formalin, for 72 hours, as compared with a sample of unhomogenized milk similarly treated."*

Experiments are needed to show the best method of fat determination in homogenized milk. Buttenberg† gives a comparison between the estimation of fat in homogenized milk by the Adams and Gottlieb methods, in which the respective amounts obtained from two samples by the former was only 2.09 per cent. and 2.82 per cent. against 2.62 per cent. and 3.32 per cent. by the Gottlieb, although the Adams extraction was continued from 10 to 12 hours.

Among the known practices which might be classed as violations of the law, or at least deceptions, are the use of inferior or foreign fats and the artificial thickening produced by homogenization, which makes a 20 per cent. cream look like a 25 per cent. or 30 per cent. article. A trick which has been used is to separate the cream from milk, homogenize it and then return it to the milk. By so doing, the cream, not being homogenized with the rest of the milk, rises and makes a greater cream line than before. During the present year there was an official seizure of a large amount of homogenized evaporated milk with a total fat content of 6.53 per cent. which consisted of a mixture of about 17 per cent. butter fat and 83 per cent. cocoanut oil. Another, although probably legitimate practice, is to separate milk when the supply is abundant, store the cream or butter made from it until milk is scarce, and then homogenize it with skim milk, or skim milk powder made from the original milk.

Just what attitude public health officials should take toward homogenized products might depend on circumstances; but it would seem as though there should be no general objection unless an unhealthful product is made or one which would tend to deceive the consumer.

With the exception of the occasional fraudulent use of the process, homogenization apparently marks a distinct advance and the product thus made seems to be of better flavor and texture than unhomogenized cream containing the same amount of fat. Another feature of distinct advantage to the public in homogenized products is that they are practically all pasteurized.

A serious difficulty in the manufacture of evaporated milk is the occasional partial separation of the butter fat. Homogenization prevents this and also permits the canning of natural sterilized milk, as the cream does not separate and the contents of the can remain in a uniform fluid condition.

One novel and apparently highly important use found for the homogenizer is the preparation of modified milk for infant feeding. Ladd has made feeding experiments on cases of fat intolerance in infants, with very promising results, by replacing butter fat with olive oil.‡ The same author has in a later paper suggested cod liver oil, soja bean oil, etc., sometimes in malt soup mixtures, and in various combinations.§

There is recent information that at least one large milk company is now experimenting with the idea of making a modified milk commercially in which cocoanut oil is substituted for butter fat for medical reasons.

It might be mentioned in passing, that there have also appeared on the market machines called emulsors which emulsify cream products in such a way that the fat is not broken up so much as to prevent the cream and butter again being separated.

Two sets of measurements were made of the fat globules in samples of homogenized cream from two different machines working under pressures of from 700 to 4,000 pounds per square inch. In general, the degree of homogenization is increased with the pressure and in one of the machines the destruction of the fat globules

* *Chemical Abstracts*, Vol. 9, No. 10, p. 1352.

† Troude, J., *L'Homogeneisation du Lait*. Librarie Des Sciences Agricolas, Paris, 1911, p. 28.

‡ Ladd, Maynard, M. D., *Archives of Pediatrics*, June, 1915.

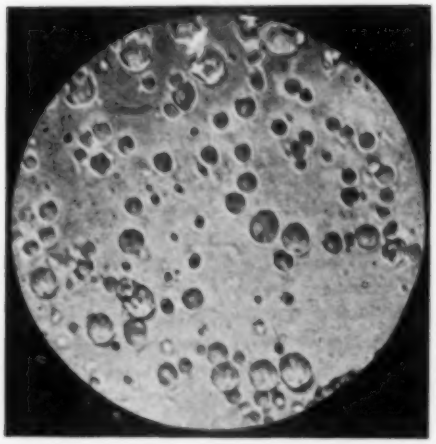
§ Homogenized Milk. Its Possible Application to Infant Feeding. *Boston Medical and Surgical Journal*, July 1, 1915.

was so great that most of them lost their spherical form and appeared like a fine amorphous precipitate when seen through a one-twelfth-inch oil immersion objective. The diameter of the majority of the natural fat globules in milk is between .005 and .006 of a millimeter and that of most of the homogenized globules between .001 and .002 of a millimeter.

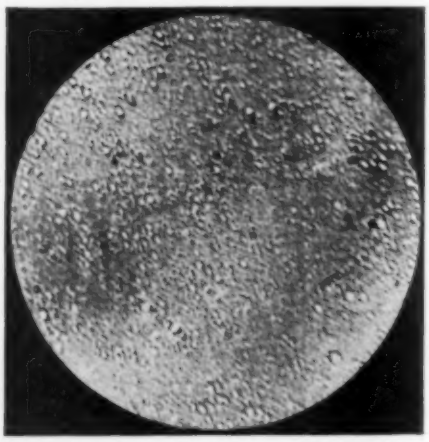
These results are shown and compared in the following table:

RELATIVE NUMBER OF FAT GLOBULES OF VARIOUS SIZES IN NATURAL CREAM AND CREAM HOMOGENIZED UNDER THE PRESSURES PER SQUARE INCH INDICATED BELOW.

	Diameters in millimeters.							
	.009–.007.	.007–.006.	.006–.005.	.005–.004.	.004–.003.	.003–.002.	.002–.001.	.001–.0005.
Natural cream.....	few	many	most	few	few	v. few		
Homogenized cream Machine No. 1.								
1,000 lbs.....			v. few	few	many	many	most	v. few
2,000 lbs.....				v. few	few	many	most	v. few
4,000 lbs.....					few	many	most	v. few
Machine No. 2								
700 lbs.....				v. few	many	many	most	v. few
2,000 lbs.....							many	mostly granular
3,500 lbs.....					v. few	few	many	mostly granular



Normal Milk 1000 Diameters.



*Homogenized Milk 1000 Diameters.

*Lack of sharpness due to active brownian movement.

ACCURACY OF DIAGNOSIS OF MUNICIPAL HEALTH CONDITIONS BASED UPON VITAL STATISTICAL DATA.

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Read before the Public Health Administration Section, American Public Health Association, Rochester, N. Y., September 10, 1915.

WITHOUT vital statistical data there can be no accurate diagnosis of municipal health conditions, any more than there can be a diagnosis without a patient.

The principal functions of a municipal health department are not only to compile statistics for future use, but to render them useful for the present—in fact, to employ them in the control of sickness and death. Everybody is vitally interested in the present, especially how to keep well or how to get well, and while many may be willing to cope with future conditions when they meet them, yet "Safety First" was always an instinct, long before it became a slogan.

In order to obtain an accurate picture of the health conditions of any municipality a complete record must be kept of morbidity and mortality statistics. As these two branches of public service are coördinate they should be under one administration, instead of being separated as they frequently are.

Mortality statistics without morbidity records would be similar to a one-sided bookkeeping. Vital statistics, therefore, in its broadest sense, forms the municipal health bookkeeping. To be of practical use it must be:

1. Accurate.

2. Complete; containing assets and liabilities, in other words, morbidity, mortality, births and marriages.

3. Available to the public.

Accuracy.—Nothing is more detrimental to any health department than to have its records questioned, but to obtain accurate records there must be coöperation between the health department, the physician, and the public. Without such coöperation no department can do efficient work and all its efforts will become nil.

Every community prides itself upon its health conditions. Unfortunately some communities, in their anxiety to outdo others, stretch this pride to a point where it becomes a common focus for suspicion.

Accuracy of diagnosis and dependability on what is presented form the mainspring of all municipal health work.

The registrar is the community's diagnostician, but he in turn must depend upon the practising physician for the reliability of his information. It therefore behooves the registrar to

not only record and tabulate the information presented, but also to keep such close scrutiny and supervision of conditions that the physician is bound to present them as accurate as it is possible to do.

Such close relationship will result in complete morbidity and mortality reports; will discover epidemics before they have impressed themselves upon the public with the seal of death; will eliminate the source and root out the evil.

Completeness.—To control disease—and to a great extent also death—the health department must know when and where disease exists, must study its cause, adopt proper methods to eliminate it, and guard against future repetition.

To obtain such results—now no longer considered ideal—the physician must make proper reports to the health department not only of notifiable diseases but of every disease with which the public is concerned.

By tact, good judgment, and the occasional aid of the courts, many health departments are gradually climbing towards the ideal in public health administration. Their success is a stimulant and incentive to others; while still another, and by no means small majority, blindly adopt whatever presents the seal of common approval.

Available for Public Use.—While "health" has always been considered "wealth," yet it is strange that man will fight for the one while totally disregarding the other. It, therefore, becomes the function of a health department not only to be the guardian of the community's health but virtually to bring health to the individual and see that he uses it, as a nurse would give a patient the prescribed medicine.

Judicious publicity, methodically and attractively presented, is universally conceded to be the best means for accomplishing such results. By employing graphic methods the public will quickly comprehend what it is intended to present as well as what is desired to be accomplished. If the department issues such information or instruction as experience has shown advisable, the public will respond. Unintelligible data, no matter how scientifically accurate or important, is a waste of energy. Short, pointed, sledge-hammer blows, which clearly describe existing conditions, will give more immediate results.

While weekly, monthly and annual publications are a necessity, yet it is well to make liberal use of the daily press. People will read in the papers what they might never see in department publications. All such departmental issues should bear the stamp of authority.

Public lectures, especially with the aid of stereopticon slides or motion pictures, are of greatest value. While entertaining the public, old and young will more easily understand what they hear by also seeing it, and the impressions thus made will be permanent.

WATER CHLORINATION EXPERIENCES AT TORONTO, CANADA.

F. Adams, M. B., D. P. H.,
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Read before the Laboratory Section, American Public Health Association, Rochester, N. Y., September 7, 1915.

THE purpose of this paper is to present briefly certain experiences at Toronto, particularly in connection with the chlorination of the water supply. At Toronto all matters having to do with the purification of the city water are in charge of the Laboratory Division of the Department of Public Health. It has, therefore, come about that we have been able to study certain problems from both a laboratory and from an operating standpoint.

As chlorination of water supplies has become more general it has, we think, come to be recognized that different waters vary a great deal in respect to the ease with which they can be chlorinated efficiently without the production of objectionable tastes or odors. In the case of some waters the dose necessary to produce an objectionable odor or taste is two, or three, or more times the dose that is necessary for bacterial destruction. Such a water is obviously easy to treat. We call waters of this kind "wide gap waters," meaning that a wide gap exists between the efficiency dose and the taste dose. A second class of waters presents a comparatively narrow gap, that is to say the dose of chlorine necessary for bacterial destruction is never very far below the dose that will give a taste. It seems possible that there is a third type of water in which the taste dose is below the efficiency dose, which means that it would be impossible to chlorinate this water effectively without having an objectionable taste or odor present all the time. We have had no experience with such a water, but can conceive the possibility of its existence.

At Toronto our water supply is drawn from Lake Ontario, and it belongs to that class of water presenting at all times a comparatively narrow gap between the efficiency and the taste doses. At Toronto the interesting point is that the gap between the efficiency and the taste doses is by no means of constant width. Under certain conditions it narrows, that is to say the taste dose and the efficiency dose move closer together, in fact we believe at times they practically coincide.

It will be understood from the foregoing that the water which we have to chlorinate is variable, that is to say we will for a period of days get a water at our intake pipes which it is possible to chlorinate efficiently without taste with considerable ease. Then in a few hours the water may change in character to a water that it is very difficult to chlorinate efficiently without getting complaints from the citizens that the water tastes and smells. We call this troublesome type of water "a susceptible water," meaning that it is susceptible to taste or smell after chlorination. At Toronto the variability of the water at the intake with respect to the ease with which it can be chlorinated satisfactorily is entirely dependent upon winds. If we have steady west winds, or north winds, or south winds—the latter being a rarity—we have no particular trouble in chlorinating the city water, but when we get a sustained east wind then we have trouble. Just why this should be we admit frankly we do not know. Color would appear to have nothing to do with the matter. We are sure also that turbidity is not a factor, and we are sure also that temperature is at least not the whole story. Our sewage disposal works discharge into Lake Ontario five miles east of the water intake, and there is no doubt that with an east wind we get some, often serious, sewage pollution. Susceptibility to taste, however, of an east wind water does not seem to vary at all uniformly with the degree of sewage pollution as determined either by bacteriological or chemical examination. Nevertheless, we consider it a decided possibility that taste after chlorination of an east wind

water is due to the formation of chlor-amines or similar substances.

Another feature of an east wind water that deserves mention is that on microscopical examination it shows the presence of an unusually large number of microscopic organisms. While some of them are of the taste and odor variety we are not able from our examinations to say definitely that the presence of these organisms makes our east wind water chlorine susceptible, although we consider that a distinct possibility.

It will be plain from what has already been stated that in Toronto it is not possible for us to add the same dose of chlorine to the city water day after day, and get efficiency in bacterial destruction, and not get taste. It is necessary for us to vary the dose fairly frequently, probably half a dozen times a week on an average, and to do this satisfactorily we were compelled to devise some reliable method for our guidance. This will be dealt with presently.

A few years ago it was not infrequently stated that if a dose of chlorine sufficient to sterilize water were used the sterilizing action was instantaneous, and the chlorine rapidly disappeared. With Great Lakes water at Toronto, at least, this is not a fact. It is our opinion that in order to be sure that bacterial destruction has been accomplished it is necessary to add to the water enough chlorine to leave a slight surplus present for at least several minutes, this surplus being recognized by the blue color given by the ordinary starch-iodide test. With our system of dose control we endeavor to keep this slight excess of chlorine a constant quantity regardless of the nature of the water that is under treatment, and regardless of the dose that has to be added in order to maintain that excess. Our procedure is as follows: We have had made up a cabinet arrangement which gives constant light conditions, and this cabinet contains a set of blue color standards made up with aniline dyes and also three burettes containing dilute sulphuric acid, potassium iodide, and freshly prepared starch. Our chlorination operators take samples of water about three minutes after chlorination has occurred, and add definite quantities of acid, starch, and potassium iodide. A blue color results, and this blue color is matched up against the set of standards The set of standards we use number 1 to 5, No. 1 being the lightest and No. 5 the darkest. Our instructions to our chlorination operators are to "Keep color No. 2." They follow out these instructions in this way. They make their tests of the chlorinated water every hour, and if the color drops to color No. 1 the dose of chlorine being added to the water is raised a notch, and after a proper period of time another test is run to see whether with the new dose there is a sufficient surplus of chlorine to give color No. 2 on the standards. If, on the other hand, the starch-iodide color in the chlorinated water should rise to color No. 3, the dose would be cut down a notch and checked up as before.

By conducting a series of tests we determined that color No. 2 represented a surplus of chlorine in the finished water that would guarantee us efficiency in bacterial destruction at all times, and in the great majority of cases would not give taste or odor, and under no circumstances a bad taste or odor. Following this method of dose determination we have at trouble periods, when the character of the raw water is changing pretty rapidly, been able over so short a period as 12 hours to cut the dose of chlorine all the way from .3 parts per million to .175 parts per million, and get efficiency and absence of bad taste throughout. Without some system of this kind of determining rapidly the dose of chlorine required at the moment, there is no doubt in our minds that we would either have lost our efficiency, or we would have had numerous complaints from the citizens about the taste in the water.

We had considerable difficulty in producing with aniline dyes a set of blue colors that really matched closely the starch-iodide color in chlorinated water at Toronto. We tried a great many dyes by themselves and in combination, and finally enlisted the assistance of an artist familiar with mixing colors. It was found in the end that by mixing a cardinal with a green we were able to get a very good match. Moreover, this combination for some reason or other gives the standard a somewhat opalescent appearance instead of being perfectly bright, and this improves the standard because the starch-iodide color is not bright on account of the presence of gelatinized starch.

It is interesting to note here that the blue color given with starch and iodine by a chlori-

nated non-susceptible water is not usually the same as that given by a susceptible chlorinated water, the latter giving a blue with more green in it.

The exact method of preparation of the aniline dye standards is as follows:

The dyes are manufactured by Read, Holliday, & Sons, 11 Gold St., New York City; and they are sold under the trade names of Brilliant Mill Green "S" and Cardinal Red "J."

Standard No.	Distilled water.	.01 Per Cent. Brilliant Mill Green "S."	.01 Per Cent. Cardinal Red "J."
1	150 cc.	4 cc.	.866 cc.
2	150 cc.	5 cc.	1.053 cc.
3	150 cc.	6 cc.	1.10 cc.
4	150 cc.	7 cc.	1.15 cc.
5	150 cc.	8 cc.	1.25 cc.

It will be noted that there is proportionately less red in the higher colors.

We do not know how long these standards will keep. We make up fresh ones every week, but it is quite possible that they would remain in good shape for a longer period than this.

As to the results to be expected by this method of control we would say that at Toronto we appear to have a water that is decidedly troublesome to chlorinate efficiently, and yet avoid taste. We have had this method of control in operation for a period of four months, and we have practically never failed to get efficiency in bacterial destruction, and complaints of taste in the city water have been comparatively rare.

It may be of interest to note that we have tried out liquid chlorine fairly extensively at Toronto, and our conclusion is that at least with Great Lakes water at Toronto it possesses no advantages over chlorine derived from bleaching powder as far as lower dose and freedom from taste are concerned.

In conclusion the writer desires to state that while he has had some part in developing the system of dose control outlined in this paper, it has in a large part been the work of Mr. J. W. Scott, who is a member of the Laboratory staff, and who has direct charge of our chlorinating plants; and of Col. G. G. Nasmith, the Director of the Laboratories.

In connection with this paper the reduction in the typhoid death-rate at Toronto in recent years is interesting.

Death-Rate from Typhoid Fever per 100,000 of Population in Toronto, Canada.

(All deaths from typhoid fever included whether of outside or inside origin.)

1910	40.8
1911	20.0
1912	12.1
1913	10.4
1914	7.5
1915	1.9

The greatest factor in the reduction shown above is believed to be chlorination of the city water supply, controlled in such a way as to be efficient at all times. It is true that in the period shown there has gone into commission at Toronto an efficient slow sand filter, but this cannot have been the big factor as shown by the following schedule showing the proportion of the water supply filtered at various times.

1910 and 1911—no water filtered.

Jan. 2, 1912—July 5, 1912, all water filtered.

July 5, 1912—Sept. 1, 1912, no water filtered.

Sept. 1, 1912—Apr. 1, 1913, 75 per cent. of water filtered.

Apr. 1913 to end of 1915, 40 to 50 per cent. of water filtered.

EFFICIENCY IN THE WORKER, AND ITS MAINTENANCE.

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Worcester, Mass.

Read before the Industrial Hygiene Section, American Public Health Association, Rochester, N. Y., September 7, 1915.

BY EFFICIENCY, only physical efficiency will be understood in this paper. Physical efficiency can best be obtained by the medical supervision of factory employees. This involves the factory's maintenance of a special medical department which shall be directly under the superintendance of the Board of Directors of the plant. The head of the department should be a doctor who shall have as assistants other doctors and a corps of thoroughly trained nurses—the number of doctors and nurses depending on the size of the plant. For a shop of two thousand employees, one doctor, with a competent male nurse and a stenographer to handle the records, is sufficient.

The medical department requires for its operation a hospital room or building which will be so equipped as to enable a department to make physical examinations, and to care for all accidents and to treat all cases of minor sickness. The best method of handling the physical examinations is to make two examinations, at least, on every employee. The first examination should be a preliminary examination made by the nurses, who, however, should have received special instructions from the doctor as to the methods of making the examinations. These examinations should be made before the employee is hired and should consist of a notation of the employee's general appearance, careful examination of the eyes and ears, position of the apex, beat of the heart, inguinal regions, whether hernia is present or not, and the extremities, and for conditions which would affect the work of the man in the department to which he would be assigned. The nurse should also note carefully any signs of possible contagious disease. If everything is normal, the man's hiring slip should be O. K'd for the preliminary examination and the man becomes employed in the shop. If any part of his body examined shows a defect the man should be held until the doctor arrives, for the doctor's approval before the slip is passed through.

Contagious diseases should always be a bar to employment. Other defects should bar from various departments depending upon the defect and the work expected of the employee.

Between two and three weeks after the preliminary examination, the employee should receive a complete physical examination by the doctor. This examination is to ascertain the exact physical condition of the employee and to advise him as to how to keep in the best physical condition. The examination should be as complete as in life insurance. Blood pressure should be taken of all employees over 20 years of age and a urinalysis done in all cases over 40, and in all cases having a blood pressure over 150 systolic. At the time of the examination the employee should receive private instructions given by the doctor—printed information as to how to keep well and what to do in case of minor accidents. Physical examinations also introduce the man to the hospital and to the hospital staff so that he knows where to come in case of sickness or accident.

Examinations should be made with the same privacy as obtained in the doctor's private office. All accidents or sickness occurring in the shop should be sent immediately to the hospital for diagnosis and, in minor cases, treatment. A shop hospital should not attempt to be a dispensary but rather a diagnostic clearing house. Cases not in need of a doctor should receive the simple treatment indicated. Those who are really sick should be instructed to see their family physicians or report at the city

hospital. Men who are out sick and return to work should be obliged to come to the hospital before resuming their work in order that the department may know definitely that they have no contagious disease, and that they have completely recovered and are able to resume work.

Where it is possible, it is advisable to have a follow-up system by which all men absent from work for more than forty-eight hours are looked up in their homes and the causes of their absence ascertained. All accidents should come at once to the hospital for treatment and should not be treated by first aid men except in plants where the hospital is too far to warrant the time to go to it for very minor injuries.

In each department the foreman should be instructed in first aid for the more serious accidents and each foreman should be able to perform artificial respiration by the Shæffer method. Each department should also have a first aid kit applicable only for severe injuries in order that prompt attention may be given to hemorrhages, unconsciousness, fracture, etc., before the man is taken to the hospital.

The medical department should supervise sanitation throughout the shop and have in its control as many employees as are necessary to maintain sanitation and perfect conditions.

The medical department should also publish monthly literature to be distributed in leaflet form in the pay envelopes, describing in simple language the more common sicknesses and accidents and the best methods of their prevention. Medical treatment should not be taken up in these bulletins.

Such a department will, undoubtedly, increase the physical efficiency of the worker and will reduce the loss of time from sickness and accident very materially in the factory.

THE NATIONAL BOARD OF MEDICAL EXAMINERS OF THE UNITED STATES.

The need of a standard medical examining body for the whole United States and its Territories (tributary thereto) has occasioned the organization of the National Board of Medical Examiners. It is a voluntary board, the members of which are selected from the Medical Corps of the Army, the Navy, and the Public Health Service, the Federation of State Examining Boards, and other representative organizations, and the medical profession of the United States.

The aim of this board is to establish a standard of examination and certification of graduates in medicine, through which by the coöperation of the individual Boards of Medical Examiners, the recipients of the certificates of the National Board of Medical Examiners may be recognized for licensure to practice medicine.

The policy of the board is to conduct its examinations on a broad scientific basis of such a high yet practicable standard that the holders of its certificates will receive universal recognition.

The independent action by the board is furthered by the financial and moral support of the Carnegie Foundation.

The permanent organization of the board will consist of the three surgeon-generals and one other representative from each of the Government Medical Services, three representatives of the Federation of State Medical Examining Boards, and six members chosen at large from the medical profession by the National Board of Medical Examiners.

Requirements.

Requirements for Admission to the Examination. Satisfactory completion of

(*a*) *High School.* A four-year high school course.

(*b*) *College.* Two years of acceptable college work, including physics, chemistry, biology, and a modern language.

(*c*) *Medical School.* Graduation from a Class "A" medical school. (American Medical Association classification.)

(*d*) *Hospital Training.* One year as interne in an acceptable hospital or laboratory.

It is expected that the examination will cover about one week.

No fee is charged for the examination itself, but a registration fee of $5 will be required.

The first examination will be held in Washington, beginning October 16, 1916.

Further information and application blanks may be obtained from the secretary, Dr. J. S. Rodman, 2106 Walnut Street, Philadelphia, Pa.

REPORT OF COMMITTEE ON WORKS OPERATION AND ANALYTICAL METHODS.

LEWIS I. BIRDSALL, F. E. DANIELS, C. A. EMERSON, JR., C. B. HOOVER, H. C. MCRAE, RICHARD MESSER, W. L. STEVENSON, *Chairman*.

Read before the Sanitary Engineering Section, American Public Health Association, Rochester, N. Y., September 9, 1915.

ANALYTICAL TESTS.

THE 1914 Progress Report of the Committee recommended the tests shown in the attached diagram as the most useful for operating control and for determining the efficiency and sufficiency of the treatment of sewage. During the past year there has been no adverse criticism of these tests, nor have any others been suggested.

Your Committee therefore desires to reaffirm the advisability of the use of these tests as far as possible in all laboratories connected with the operation of sewage treatment works, for, in addition to their usefulness, general adoption would make possible comparison of results of operation from published reports.

This does not mean that other tests should necessarily be abandoned, for that would interfere with comparisons between past and present results of operation, which would be disadvantageous for local purposes.

IMPORTANCE OF EXPERT OPERATION.

The volume of sewage in America which must be taken care of is increasing rapidly each year. This is attributed to the natural growth of cities and towns, and is also due to the general demand for complete sewerage facilities throughout the country, which requires the installation of new sewer systems and the extension of existing ones. These conditions add steadily increasing loads upon the water courses while their ability to receive the sewage does not increase and in some cases actually decreases; consequently, the pollution of water courses is becoming more evident and in many instances has gone beyond safe limits.

The continued increase of urban population throughout the country compels the municipalities to depend for the most part upon the large surface streams for sources of water supply. Certain pathogenic bacteria contained in sewage, notably those causing typhoid fever and certain forms of dysentery, are capable of surviving for considerable periods in water, and even after being transported for many miles by stream, may produce disease if again taken into the human system.

The people at large are waking up to the importance of maintaining our rivers and streams in a reasonably clean condition, so that they may serve as proper sources of water supply and be useful for both industrial and pleasure purposes. To conserve these natural advantages sewage treatment

works are being constructed all over the country and these in the aggregate represent the investment of large sums of money.

It is therefore surprising to learn how few sewage works in America are under competent supervision and provided with laboratory facilities, in fact only a few of the larger plants receive such attention.

In the case of water purification plants, the public in general demands that the works shall be operated with skill and that the product delivered to the consumer shall be the best that can be obtained with the available facilities. This is only natural, as a deterioration in quality, even though it be for only a short period, is apt to have a direct and deleterious effect on the health of the community. On the other hand, inefficient or careless operation of sewage treatment works does not, as a rule, give rise to a storm of protest, unless the error is so great that it is apparent to the most casual observer.

One of the reasons for this lack of interest on the part of the public is that in many cases sewage treatment works are installed for the good of the commonwealth and the citizens of the town do not personally realize the resulting benefits. Another reason lies in the fact that sewage works are frequently objectionable and untidy; this is due to the lack of appropriation of sufficient funds for maintenance, and sometimes to carelessness.

With modern processes and proper operation it is possible to reduce objectionable sights and odors to such a point that only a prejudiced visitor will be dissatisfied. A reasonable amount of money spent in laying out flower beds, shrubbery, and trees, and in taking care of the grass and walks will be more than returned in the added interest in the plant by its operators and by the citizens.

Your Committee begs to call the attention of designing engineers to the importance of including the sodding or seeding of slopes and planting of trees and shrubs in the contracts for the construction of sewage treatment works, for new works are too often left in a very unsightly condition with respect to landscape embellishments.

Municipalities frequently employ expert engineers to study local conditions and to design sewage treatment works, but when such works are put in service their operation is intrusted to an untrained employee, transferred from some other branch of the service, who is totally lacking in knowledge of the complex forces which must be controlled in order to produce the results which the designers intended and for which the funds were invested.

This is poor business policy; a municipality or private owner would not attempt to operate a power plant or other installation involving complicated machinery without the services of trained engineers because they know it would not be economical to do so.

Need for Laboratory Control.

Where sewage treatment works are of sufficient size to warrant it, laboratory control will allow improvements in methods of operation whereby failures may be averted and the capacity

of the plant maintained to an extent which will more than pay for the small expense involved.

In the case of a small works the expense of an individual laboratory will usually be prohibitive. However, if there are several such plants in the same neighborhood, it may be possible to obtain the services of an expert operator, provided with a laboratory, to look after all of them, and the expense divided among the several communities would be very small. It is recommended that designing engineers call the attention of their clients to the necessity and economy of such operating control.

Central Authority Advisable.

As the great majority of sewage treatment works in America are small and frequently widely separated, it is apparent that the needed expert supervision cannot be obtained locally and that efficiency of operation can only be obtained through some central authority.

In several states, the legislatures have empowered the state boards of health with authority to control the pollution of water courses, and their approval is required before sewerage works can be constructed.

The State Board of Health, in its uniform relation to all the municipalities of the state and with similar boards in adjacent states, is in a position to perform such a service to better advantage than any other body now existent in the usual organization of the various state governments of the country. The problem is not for the national government, as the operation of sewage treatment works requires oversight by individuals familiar with local needs, characteristics and possibilities, and stationed within a few hours' travel of the local works, in order to be of service in case of emergencies which require immediate attention or advice. On the other hand, except in scattered cases, the unit of the county appears to be too small.

In municipalities where sewage treatment is intrusted to competent, expert employees and where this work has the strong, moral and financial support of the citizens, the exercise of state authority and supervision is but little needed. But in such cases the coöperation of state and municipal officials is of mutual advantage.

For the state boards of health to act intelligently they should know the methods of operation and results accomplished in all the sewage treatment works in the state. They would then be able to act as clearing houses, applying to one works the information obtained from several others operating under similar conditions. Such information must, of course, be applied to any particular works by one who is thoroughly conversant with local conditions and able to distinguish the peculiarities and differences involved. The operation of each works is a purely individual matter. Blindly copying, without due analysis of the local conditions, is generally fatal.

This would in no way encroach upon the province of the private or consulting engineer; on the contrary, it would be to his advantage.

The state is interested in seeing that the existing works accomplish the best

results possible and the separate communities are naturally anxious that the works shall meet the requirements at the minimum expense for operation, additions and renewals.

Data Required.

To obtain these data, information is required on the following:

1. The purpose of the works, *i. e.*, are they primarily intended to protect sources of water supplies or to prevent the creation of nuisance.

2. The construction of the works, *i. e.*, the details of each process which influence operating methods, rather than the stability of the structure.

3. The quantity and character of the sewage to be treated.

4. The methods of operation and results accomplished.

The data concerning the construction of the works should be obtained by the State Board of Health, either through plans submitted for approval supplemented by record plans after the works are constructed, or, in cases where the Board is not yet clothed with such authority, by means of inspection and measurement. Any changes from the original contract drawings or alterations after the plant is in service should be especially noted, as these may be vital information in connection with operating policies.

It is presumed that in those states where the law does not require approval of sewerage works before construction, the number of plants is small and hence there should be no difficulty in obtaining the needed data.

The records of operation and results accomplished should be furnished the state by the town or owner upon blank forms prepared by the town officials or the owner in conjunction with the state officials.

Report Forms.

It is practically impossible to recommend a standard form of report blank to cover all the many types of apparatus used in sewage treatment. If, however, the report form for each works in a state is prepared to meet the local needs, it can still contain essential data so recorded that reports of operation of similar types of apparatus in different works will be in identical form for comparison.

In preparing such forms, it should be borne in mind that the small works are generally operated by employees lacking a technical education and therefore clearness and simplicity should be obtained by having as much as possible printed, leaving only figures to be filled in.

The reports should be printed on sheets either $8\frac{1}{2}''$ x $11''$ or of such size as to conveniently be folded to $8\frac{1}{2}''$ x $11''$, so as to facilitate filing in standard letter files. It would be desirable to have the sheets made up in the form of pads, so that the operator by placing carbon paper beneath the top sheet could obtain a copy.

The record sheets should be signed by the operator and mailed at monthly intervals to the office of the State Board of Health.

TESTS FOR DETERMINING THE COMPOSITION OF CRUDE SEWAGE FOR COMPARISON.

OCCASIONAL COMPOSITE SAMPLES TO BE ANALYZED FOR NITROGEN AS ORGANIC AND AS FREE AMMONIA—TEST FOR SUSPENDED MATTER CALLED *Y* IN REPORT AND CHLORINE AT SAME TIME SAMPLES TO BE EXAMINED FOR AVIDITY FOR OXYGEN TEST CALLED *X* IN REPORT.

FOR SEWAGE TREATMENT WORKS PRIMARILY DESIGNED TO PREVENT NUISANCE.

Type of works	Tests for operating control and determination of efficiency					Tests to determine sufficiency of treatment
	Influent and effluent of preliminary processes	Sludge drawn from		Effluent of oxidation process	Final effluent as discharged into the receiving body of water	Receiving body of water
		One story tanks	Two story tanks			
Works consisting of preliminary processes only such as fine screens or sedimentation	(1) Test for the avidity for oxygen called *X* in text (2) Test for suspended matter called *Y* in text	(1) Specific gravity (2) Percentage moisture in wet sludge (3) Percentage of dry residue that is volatile (4) Reaction of wet sludge			(1) Test for avidity for oxygen called *X* in text (2) Test for suspended matter called Y in text	(1) Dissolved oxygen
Works consisting of preliminary and oxidation processes such as contact beds or percolating filters				(1) Nitrogen as nitrates (2) Test for the avidity for oxygen called *X* in text (3) Dissolved oxygen (4) Relative stability*	(1) Test for avidity for oxygen called *X* in text (2) Nitrogen as nitrates (3) Dissolved oxygen (4) Test for suspended matter called *Y* in text (5) Relative stability*	(2) Test for avidity for oxygen called *X* in text

FOR SEWAGE TREATMENT WORKS PRIMARILY DESIGNED TO PROTECT SOURCES OF WATER SUPPLY.

Works consisting of preliminary processes and disinfection	(1) Test for the avidity for oxygen called *X* in text (2) Test for suspended matter called *Y* in text	(1) Specific gravity (2) Percentage moisture in wet sludge (3) Percentage of dry residue that is volatile (4) Reaction of wet sludge			(1) Presumptive test for B. coli (2) Test for avidity for oxygen called *X* in text (3) Test for suspended matter called *Y* in text	(1) Presumptive test for B. coli (2) Dissolved oxygen (3) Test for avidity for oxygen called *X* in text
Works consisting of preliminary and oxidation processes and disinfection				(1) Nitrogen as nitrates (2) Test for avidity for oxygen called *X* in text (3) Dissolved oxygen (4) Relative stability*	(1) Presumptive test for B. coli (2) Test for avidity for oxygen called *X* in text (3) Nitrogen as nitrates (4) Test for suspended matter called *Y* in text (5) Relative stability* (6) Dissolved oxygen	

* In small plants not provided with a laboratory relative stability may take first place.

It is again desired to call attention to the importance of recording essential data. In the majority of sewage treatment works no provision is made to obtain a record of the rate of flow to the plant even though such information is vital to proper operation. The Committee strongly recommends that engineers in designing new works provide means for easy measurement of the flow and that measuring devices be installed in existing works not now so equipped.

When the record forms are printed, blank spaces should be left at convenient places where it may be desired to put figures resulting from computations by the state authorities.

For example, if the operator reports that sludge was placed on drying bed "D" to a depth of 7 inches, the state official, knowing from the records the area of the bed, can compute the number of cubic yards of sludge, which he would enter in the blank space mentioned.

Results Which Can Be Obtained by Adopting These Recommendations.

If this system of obtaining data were to be put in force, in a short time the state officials would be in possession of a fund of information which could be used in advising operators of sewage works and this would not only aid the local communities but also the commonwealth.

When sewage works are operated without producing nuisance and at a reasonable expense, the objection on the part of communities to being compelled to install works will diminish, for the fear of failure will be lessened.

It would be of further advantage if the state boards of health would use the information so gathered to prepare pamphlets written in clear, popular style, to call to the attention of town officials the need for, and value of, sewage treatment not only as a local matter but in its broader effect upon the commonwealth.

◆

THE PROGRESS OF CIVILIZATION.

In the earliest history of the race nobody cared for babies, except, perhaps, their mothers.

Babies had no rights; they were only a necessary evil—and the records of the slow progress of civilization might be written in the blood of babies.

In the South Sea Islands, when either parent died, the children were slain and buried that they might wait on the parent in the other world.

In China, girl babies in the interior provinces were drowned or thrown in towers to perish.

In parts of India the mother put opium on her breasts that the baby might take it with the milk and die.

Even the Greeks, who established a civilization higher than that of any other ancient people, exposed their undesired infants on the mountain tops.

But little by little, through the succeeding centuries, the baby has been coming into its own, until today the infant death-rate is considered the best index to a civilization.

By the same standard may be measured the civilization and the evolution of the individual.

What babies' lives are made they will be. Through them and their descendants influences for good or for evil are perpetuated to the end of time.

According to these influences the greatest empires have arisen and fallen, the most powerful dynasties have come and gone.

America can not hope to escape the great law of causation.

In a million years, when the forests are felled and the streams are dried and when the desert prevails, will it become a field for the surveying parties of the archaeologist hunting for relics of a well-nigh forgotten people?

Will all that remains of America be the ruins of another civilization? Or will her character and her influence endure as a priceless heritage to a greater and a nobler race?

The answer will be written in the care that is bestowed on the babies.—*Bulletin of Kansas State Board of Health.*

REPORT OF THE COMMITTEE ON HABIT-FORMING DRUGS.

To the President and Members of the American Public Health Association

GENTLEMEN:

Your Standing Committee on Habit-Forming Drugs, recognizing the importance of the subject intrusted to its charge and the need of its careful consideration, have requested certain persons to serve as an Advisory Committee and those whose names are given below have consented to render this service.

We deem it our duty to give utterance to our recognition of the able and conscientious work of the United States Commissioner of Internal Revenue, the Hon. W. H. Osborne, and desire to pledge him our assistance whenever possible. We also desire to acknowledge the efforts of those members of the medical and pharmaceutical professions who have aided in the passage and enforcement of the Federal Anti-Narcotic Law known as the Harrison Act.

In connection with the problem of narcotism in this country, its importance to our people and its relation to the Harrison Act, we desire to make certain recommendations. These we have divided into two classes: First, those dealing with the operation of the Federal Law; Second, those dealing with the problem in general as related to other constituted authorities and to the public.

(1) We recommend as essential to the better solution of this problem, that Section 6 of the Harrison Act be repealed.

(2) That physicians and druggists who may, from time to time, be shown to be habitual users of narcotic drugs be denied the privilege of registration as dealers and dispensers of these drugs.

(3) That upon a second conviction for violation of the act revocation of the registry number of the violator together with denial of future privilege to register be made a part of the penalty.

(4) That an increase be made in the number of special agents delegated with the enforcement of this act, in order that the territory of each agent be reduced in area.

(5) That a census be made of all habitual users of narcotic drugs.

(6) That the Collectors of Internal Revenue of the various districts be instructed to require, from all dealers in these drugs, an accounting of all purchases and disbursements every ninety days and further that, in each district, these returns be published in the daily papers.

(7) That, wherever possible, the collectors in the several districts and their agents coöperate with the local authorities for the suppression of narcotism.

Under the second heading your committee would recommend the following:

(1) That the proper authorities in the several states of the union undertake the establishment of custodial institutions together with provisions for commitment for noncriminal drug users, and that the authorities of the penal institutions of the several states be urged to undertake the segregation and treatment of inmates who are habitual users.

(2) That in state or municipal hospitals, asylums, penal and other institutions, there be made a careful study of the physiology and psychology of drug addictions.

(3) That there be enacted state laws of greater uniformity and embodying more efficient restriction of physicians, dentists and veterinarians in some such manner as is embodied in the Florida Statutes for 1915 or in similar laws.

(4) That all private institutions for the treatment of drug addictions be under the supervision and regulation of the several state boards of health and further that each state enact such laws as will abolish mail order cures.

(5) That each local medical society appoint a committee on Drug Law Enforcement, which committee shall be willing at all times to give expert testimony relating to narcotism when called upon by the local or federal authorities.

(6) That medical schools and training schools for nurses make a special effort to impress upon their pupils the need of greater caution in the administration of narcotic drugs. Your Committee regrets that the selection of the Advisory Committee has delayed its work during the

period which has elapsed since its appointment, but wishes to present for your consideration an outline, which has been adopted for the further carrying out of its work. This outline embraces a study of the narcotic drug problem in its various aspects as follows:

ETIOLOGY.

Subjective.

Heredity.
Alcoholism.
Psychology.

Extraneous.

Rôle of physician.
nurses.
druggist.
peddlers.
corner groceries and saloons.
commissary stores.
diseases:
(a) Acute.
(b) Chronic or recurrent.
accidents and operations.
army disease.
quack cures:
(a) Institutional.
(b) Mail order.
patent medicines.
interstate traffic.
(a) Mail orders, postal orders.
(b) Express service.
(c) Messenger service.
(d) Inter-urban.

Combined.

Social evil.
"Chinatown":
(a) Opium smoking.
(b) Prostitution.
Environment.

DISTRIBUTION.

1. Geographic:
North and South.
Canada.
Cuba.
Mexico.
2. Racial:
(a) White,
(b) Black,
(c) Nationality (Native born) (Foreigner).
3. Urban and rural.
4. Sex.
5. Age period.

ATTITUDE OF PUBLIC.

1. Of laity:
(a) Ignorance.
(b) Disgust.
2. Of physicians.
3. Of church.
4. Of educational institutions.
5. Woman's clubs.
6. Nurses' associations.
7. Public welfare associations.
8. Temperance leagues.
9. Press:
(a) Newspapers.
(b) Journals.
10. Police.

INSTITUTIONS.

1. Detentional:
(a) Prisons.
(b) Workhouses.
(c) Insane asylums.
2. Hospitals and sanitoria.
3. Educational:
4. (a) Medical schools.
(b) Colleges.
(c) Grammar and high schools.

OCCUPATIONS.

1. Brain workers:
(a) Medicine.
(b) Nursing.
(c) Journalism.
(d) Druggists.
(e) Teachers.
(f) Dentists.
(g) Church.
(h) Lawyers.
2. State.
3. Prostitutes.
4. Sporting class.
5. Mechanics and laborers.
6. Clerks.
7. Business men.

STATISTICS.

1. Importation.
2. Production (culture).
3. Manufacture.
4. Exportation.
5. Sale.
6. (Amount used legitimately, cocaine in particular.)
7. Illicit importation.

Present Narcotic Legislation.

(Including Canadian and United States Dependencies.)

Bibliography.

In the selection of our advisory committee we feel that we have been fortunate in securing the interest and assistance of the following individuals:

Samuel Hopkins Adams, Ensenore, Cayuga Co., N. Y.

C. L. Alsberg, Chief, Bureau of Chemistry, U. S. Department of Agriculture, Washington, D. C.

President Clarence A. Barbour, Rochester Theological Seminary,

Surgeon General Rupert Blue, U. S. Public Health Service, Washington, D. C.

Surgeon General W. C. Braisted, U. S. Navy, Washington, D. C.

Rt. Rev. C. H. Brent, Protestant Episcopal Bishop of the Philippines.

T. D. Crothers, M. D., Walnut Lodge Hospital, Hartford, Conn.

Ella Phillips Crandall, R. C. Secretary National Organization for Public Health Nursing, New York City.

Miss Katherine Bement Davis, Department of Correction, Centre and Chambers Sts., New York City.

Rev. Edwin C. Dinwiddie, Supt. National Temperance Bureau, Washington, D. C.

W. A. Evans, M. D., Chicago *Tribune*, Chicago, Ill.

Lee K. Frankel, Ph. D., The Metropolitan Life Insurance Co., New York City.

Mrs. Thomas Gladding, Essex Falls, N. Y.

Elizabeth P. Gordon, Vice Pres. W. C. T. U., 12 Pinkney St., Boston, Mass.

Surgeon General Wm. C. Gorgas, U. S. Army, Washington, D. C.

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Richard Hooker, Editor *Springfield Republican*, Springfield, Mass.

Dr. Frederick C. Howe, Commissioner of Immigration, Ellis Island.

Woods Hutchinson, M. D., Hotel Marseilles, New York City.

David Starr H. Jordan, President Leland Stanford University.

L. F. Kebler, Chief Bureau of Chemistry, Washington, D. C.

Helen F. Kimball, 294 Kent St., Brookline, Mass.

J. H. Landis, M. D., Health Officer, Cincinnati, O.

Ben B. Lindsay, Denver, Colorado.

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Maud E. Miner, 130 E. 22d St., New York City.

E. A. Moree, 105 E. 22d St., New York City.

George E. Petty, M. D., Memphis, Tenn.

T. H. Potts, Secretary National Association Retail Druggists, Dearborn St., Chicago, Ill.

Joseph R. Remington, Ph.M., 1832 Pine St., Philadelphia, Pa.

Franz Schneider, Jr., Department Surveys and Exhibits, Russell Sage Foundation, New York City.

Mrs. W. R. Schoff, President National Mothers' Congress, 3418 Baring St., Philadelphia, Pa.

William Howard Taft, New Haven, Conn.

Wm. C. Woodward, M. D., Health Officer, Washington, D. C.

Mary E. Woolley, President Mt. Holyoke College, South Hadley, Mass.

Rabbi Stephens S. Wise, 23d and 90th Sts., New York City.

Dr. Harvey J. Wiley, Washington, D. C.

Mrs. Harriet B. Waters, Editor of the *Federated Clubs Magazine*, 409 Pearl St., New York City.

Lillian D. Wald, Henry St. Settlement, 265 Henry St., New York City.

In submitting this report we would emphasize the fact that it is the opinion of the committee as a whole that the problem of narcotism is of far greater significance to this country than has been generally supposed; that existing legislation will not prove a solution and that the utmost effort should be made by the members of the American Public Health Association and all others concerned with the public welfare, to reach an early solution.

(Signed)

Lucius P. Brown,
J. Frank Chase,
Ernest K. Coulter,
George Donohoe, M. D.,
Jeannette Marks,
C. E. Terry, M. D., *Chairman*.

Book Review.

The Mortality from Cancer Throughout the World. *Frederick L. Hoffman, LL.D., F. S. S., F. A. S. A., etc. The Prudential Press, Newark, N. J., 1915.*

In 1912 by invitation of the American Gynecological Society, Frederick L. Hoffman, the eminent statistician of the Prudential Insurance Company, delivered an address on "The Menace of Cancer" at an annual meeting of that society which was otherwise distinguished by the adoption of measures looking toward the organization of a national campaign of education for the control of this disease. Dr. Hoffman was led by this and similar requests to direct special attention to the available statistical data on the subject and his studies soon convinced him that the increasing prevalence of cancer constitutes a much more serious problem for the medical profession and the public than is commonly realized. From this starting point he became more and more deeply interested both in statistical research and in practical efforts to combat the disease. Finding that the data on cancer mortality were inaccessible to easy collection and comparison, Dr. Hoffman conceived and has now executed the ambitious project of his present work, which is appropriately dedicated to the American Association for Cancer Research, the special organization of laboratory students of this disease, and to the American Society for the Control of Cancer which was founded three years ago for the complementary purpose of bringing to more practical application the results already obtained by scientific investigation. The volume, handsomely printed and bound, is published by the Prudential Insurance Company which thereby adds new laurels to its record of substantial contributions to the scientific study of social problems.

Upon opening this eight-hundred-page book one sees at a glance what a prodigious range of information the author, with characteristic industry and thoroughness, has assembled and presented. Thus is foreshadowed his fundamental purpose which, as frequently emphasized in the preface and elsewhere, is not to attempt a final answer to the many questions involved in the study of malignant disease, but rather "to facilitate the statistical study of the cancer problem throughout the world." To this end it has seemed to Dr. Hoffman "of more practical importance to provide the student of the cancer problem with the available material for statistical research, rather than with theories or criticism however well justified by the facts." This clearly defined purpose has been steadily adhered to in the selection and arrangement of the material presented. The work falls into two main parts; 200 pages of text discussion precede an extended section of tables, diagrams and charts, and other illustrative matter constituting the remainder of the book and arranged in eight appendices. In fact it may be said quite seriously that the work consists largely of these appendices which, with the bibliography and subject and author indexes, occupy 604 out of the 826 pages.

A closer examination of the several sections gives the reader an ever increasing realization of the mass and scope of this study and the enormous volume of clerical and mechanical labor and patient correspondence that must have attended its compilation. One sees also how faithfully the author has endeavored to carry out his purpose of making all the cancer statistics of the civilized world readily available under uniform and comparable arrangement in systematic tables prepared so far as possible on an identical plan and carefully listed and indexed. Since they constitute the substantial body of the work the several appendices merit brief description. In the first we find eight of the best known classifications of tumors. In the next section have been conveniently reproduced a number of forms and blanks used in special cancer inquiries, such as that made by the Imperial Cancer Research Fund, the United States Census Bureau, the New York State Department of Health, the International Cancer Research Association, etc. Appendix C gives eight tables of cancer mortality in relation to various occupations as recorded in England

and Wales, in Hungary and in the experience of the Prudential Insurance Company. The cancer mortality statistics of American and foreign life insurance companies occupy 121 separate tables in Appendix D. Appendix E offers in four extended tables a geographical survey of cancer mortality according to latitude, in the large cities of the eastern and western hemispheres, in the larger cities of the world, and in detail by organs and parts for thirteen principal ountries.

The cancer mortality of the United States is thoroughly presented in the two sections of Appendix F. The first section contains seventy-four tables of the statistics compiled by the Bureau of the Census for the United States Registration Area and its constituent state and local subdivisions. The second part reproduces in 185 tables the original reports of all the more important American state and municipal registration offices.

In Appendix G follows an extraordinary assemblage of 378 tables of cancer mortality of various foreign countries, provinces and cities. The first of these tables summarizes the statistics for the entire civilized world, and the last gives cancer deaths by organs and parts in Montevideo from 1907–1911. Between these extremes all the leading countries of Europe and their principal cities as well as countries and colonies throughout Asia, Australasia and South America are extensively represented.

The last appendix reproduces several circulars and papers illustrative of the campaign for the control of malignant disease through educational propaganda.

The text comment and discussion occupying the first quarter of the book is arranged in nine chapters dealing with such topics as the statistical basis of cancer research, the increase in cancer, the occupational phases of the disease, the relation of cancer to life insurance problems, and the geographical incidence of cancer in America and foreign countries. In his final chapter the author offers a wide range of general observations and conclusions on the cancer problem, grouped under topics which refer to many of the questions the lay reader is most likely to ask. Space is lacking for an adequate summary of even the outstanding features of these readable chapters. Possibly one of the most interesting is that on the increase of cancer. The author has for some time been known as an earnest and militant protagonist of the view that the recorded increase in the cancer death-rate reflects for the most part a real and menacing increase in the prevalence of this scourge. This belief has led him to redouble his advocacy of such methods of warfare against cancer as promise to restrict and control its excessive mortality. Not without relish he again takes up the controversial weapons in this chapter and makes out a strong case for his views on this phase of the cancer problem which he regards as "one of the most important problems in modern medicine." Not alone the great mass of data tending to show an almost universal increase, but also the more impressive arguments which the author derives from his detailed analyses and comparisons will more than ever place the burden of proof on those who deny the reality of the increase of this disease.

A useful contribution to the study of cancer increase will be found in the author's effort to bring down to date the examination of the cancer statistics of Frankfurt-am-Main. As is well known, the statistics of this German city, owing to their detailed reference to organs and parts of the body, have provided a favorite battle ground of statistical controversy every since the classical argument of King and Newsholme in 1893. The conclusion reached in that well known paper that the cancer increase was only apparent was based largely on the Frankfurt figures showing "that in those parts of the body in which cancer is easily accessible and detected there has been no increase in the mortality from it between 1860 and 1889." Pointing out that King and Newsholme have failed to reëxamine into the facts during the long period since 1889, Dr. Hoffman also calls attention to the serious defects of the Frankfurt classification of organs as compared with the one used by the Registrar-General of England and Wales for several years past, which is derived from the International List of the Causes of Death. Yet even on the basis of this defective classification, the author goes on to show, it appears from the Frankfurt figures for 1906–1913, here assembled, that among males the cancer mortality has increased in every group of organs both accessible and inaccessible except the respiratory organs, which are relatively unimportant. Among females

cancer of the respiratory organs and of the skin have decreased but cancer of the other groups increased, including cancer of the generative organs which King and Newsholme classified among the accessible forms. In other words, according to Dr. Hoffman, the most recent data do not confirm the earlier conclusion that the increase in cancer was only apparent and not real. Members of the American Public Health Association will recall that Professor Walter F. Willcox presented at the Jacksonville meeting in 1914 a preliminary paper on his original study of the Frankfurt figures from 1865 to date. Students of this particular topic will await with interest the completion and publication of Professor Willcox's conclusions.

Dr. Hoffman has rendered such notable services to the cause of cancer research and to the campaign for the practical prevention and control of this disease that it may seem invidious to suggest that his work leaves anything to be desired. The lack if any is perhaps most likely to be felt by the general reader who attempts to digest on any one occasion too many pages of the rather solidly printed text. The assiduity with which data have been collected from a wide range of reading exhibits both the advantages and disadvantages of the method. The student who desires a reference volume will find here a veritable encyclopedia. On the other hand the author's inclusive purpose and method have possibly led to occasional faults of diffuseness and insufficient organization of chapters and sections, so that the trail of the argument is sometimes hard to follow through the forest of illustrative notes and remarks. One feels also the need of somewhat more critical differentiation among the authors and sources so frequently quoted. In such a catholic survey including references to many papers of less value it is surprising that the author should have failed to take account of the dissertation of Greenwood and Wood of the Lister Institute presented in 1914 before the Royal Society of Medicine. At the end, however, a feeling of wonder remains that the author in the midst of his arduous official duties has found the time, energy, and organizing capacity necessary to conceive and execute such a notable and exhaustive contribution to the statistical study of cancer.

Curtis E. Lakeman.

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Annual Report of the Department of Health, 1915, Richmond, Va. Chief Health Officer, Dr. E. C. Levy.

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Health Department Reports and Notes.

REPORTS.

Colorado Springs, Colorado.

This city of some 32,000 inhabitants reports a death-rate of 15.56 per 1,000, an increase of 1.03 over the 1914 rate. Believing that "the one object of the existence of our department is to lessen the number of cases of preventable sickness and death," a careful study of the death records was made to ascertain, as far as possible, the cause for such an increase. The results of this study well sustained the fact, lately realized by health workers, that the increase of deaths was due largely to organic disease among the higher age groups. In this city for 1915 there were twenty more deaths from organic heart disease, six more from arterio-sclerosis, seven more from apoplexy, and nine more from diseases of the kidneys, than in 1914, making an increase of forty-two in these four degenerative diseases. In comparing the ages at which the deaths occurred, it was found that under fifty years of age, the death-rate was less than in 1914, while over fifty there was a decided increase. There was also an increase in pneumonia in 1915, due probably to the epidemic of so-called "grippe" which was particularly hard on the tuberculars and aged.

It is pleasing to note that there was but one death from a contagious disease and only thirty-two cases of such diseases reported. No doubt the morbidity was kept down in the case of diphtheria by an extensive examination for carriers. Five cases and eighteen carriers were found after an examination of 1,400 cultures.

There were only two deaths from tuberculosis contracted in that city. The peculiar position of this city, as a health resort for the tuberculous from all over the country, is well realized, and it is obvious that the comparatively high death-rate is due to non-resident deaths. This is best evidenced by the fact that the total death-rate of 15.56 per 1,000, by excluding the non-resident deaths, is reduced to 9.81. Thus out of a total of 498 deaths there were 217 bodies shipped out of the city.

Much credit is given to the work of the school nurse, who, though handicapped by having to cover a large territory alone, has been of great assistance in the detecting and tracing cases of contagious disease. It is hoped that it will be possible to have more nurses, and to have their work supplemented by medical inspectors.

In the anti-fly campaign, the rule, requiring the hauling away three times a week of stable refuse, has proven most satisfactory, and its benefits happily are recognized by the citizens. Much attention and excellent work is being accomplished in the control of the water and food supplies, and, though it is found difficult to impress dairy men of the value and necessity of personal cleanliness, other factors have been brought up to a high standard.

Brockton, Massachusetts.

The report of Dr. F. J. Ripley, Health Officer of this city of approximately 65,500, shows a fine record of work for 1915. The mortality-rate has reached the low figure of 10.49 per 1,000, an appreciable decrease from the rate of 11.64 for 1914. During the year 1,829 cases of contagious disease were reported, an increase over 1914, though this year the deaths from such were considerably lower. The increase is accounted for partly by a larger number of reports of minor diseases by the parents.

One hundred and ninety-seven cases of tuberculosis were reported with fifty-three deaths. An interesting comment on tuberculosis in comparison with all other contagious diseases is made, as follows:

"The total cost for tuberculosis work during the year was $8,694.19, as compared with $1,931.77 spent for the care of all other contagious diseases. It is readily seen that the tuberculosis problem is a big one, when you consider that 197 cases of tuberculosis were reported, as compared with 1,632 of all other reportable diseases. A comparison of the mortality shows that fifty-

three deaths from tuberculosis were recorded out of eighty-four deaths from *all* contagious diseases."

It is evident that one of the most pressing needs for this city at present is the establishment of a tuberculosis hospital, since now the department finds it difficult to provide treatment for the many cases reported. Active plans are now underway for the carrying out of this project.

The infant mortality was 2.8 per 1,000 inhabitants as compared with 3.7 for the state as a whole. Much of the credit for this low rate is due to the most careful milk inspection and the attention paid to the sanitary conditions of the city. It is gratifying to note the special work being done along this line, particularly in regard to post-natal care, the distribution of circulars in several foreign languages instructing mothers in regard to milk supply and eye infections, and milk stations in the poorer sections of the city.

Brockton is to be congratulated on the quality of its market milk. At the recent state-wide contest, held by the Massachusetts State Board of Agriculture and the Massachusetts Dairymen's Association, this city was awarded the silver cup for having the best market milk of the state. This is no doubt due to the belief, long held by the board of health, that the appearance of a dairy, as evidenced by its score, is no criterion of the character of its product, and so a dealer's product has long been judged by the product itself.

The health work of this city has constantly been of a creditable nature, and the increased per capita cost of health work to 8.72 seems well rewarded.

Haverhill, Massachusetts.

After a brief and excellent discussion on the tendency of the modern public health movement and its relation and significance to the activities of a city health department, this city reports the lowest mortality-rate in its history, 13.75 per 1,000 population, with the average age of the decedents the third highest in the last thirty-five years.

This lowering of the death-rate is remarkable since in almost every instance the morbidity from contagious disease was in excess of last year's records, there being 1,189 cases of contagious disease reported in 1915 to 666 cases in 1914, the greatest increase being in diphtheria and measles.

In accordance with the state law requiring the establishment of a tuberculosis dispensary, this city was one of the first to respond, and much credit for the carrying out of the project is due to the assistance and coöperation of the mayor and city council.

The number of school physicians was increased from two to four and an additional visiting nurse was secured. It is hoped that another visiting nurse will be added to the staff to devote her entire time to work among the school children. Since the reports of the medical school inspectors show that less than 50 per cent. of the cases of poor teeth are attended to, the securing of one or more school dentists is advocated.

It is also recommended to transfer the inspection of plumbing to the building department. This plan has been discussed and adopted in several places throughout the country, chiefly in New Jersey, and the change seems logical. Another recommendation is the installation of a card catalogue system for recording contagious diseases. This certainly should be done, and the slight increase in expense is well set off by the increased efficiency of the department, both as to routine filing and to the following-up of cases.

The work of this department is a creditable example of the application of new methods and more extensive effort to meet the ever increasing demands of a growing city.

NOTES.

"We Are a People Striving for Healthful and Useful Living."—The monthly reports of the consolidated boards of health of Wilmington and New Hanover County, North Carolina, are inspiring examples of the splendid awakening of the South to the importance of vigorous public health work.

The December report of 1915 contains a review of the remarkable work accomplished through four and a half years of continuous and sus-

tained effort. Thus the general death-rate fell from 29.43 in 1911 to 16.4 in 1915. Infant deaths fell from 1,123.03 per 100,000 in 1911 to 474.2 in 1915. The efficiency of the public health control is vividly shown in the death-rates from the communicable diseases. Typhoid fell from 100.98 in 1911 to 9.2 in 1915. Enterocolitis, an infectious diarrhea, caused a rate of 411.64 in 1911 but only 80 in 1915. Malaria, at one time one of the most prominent causes of death in Wilmington, fell to 6.1 in 1915. The tuberculosis rate shows a steady decline from 244.67 in 1911 to 163.3 in 1915.

"The past year has seen the introduction of a whole-time food inspector, a whole-time school nurse, the installation of a modern abattoir and reduction plant, the installation of modernly equipped meat markets with cold storage and refrigerating cases, three in number, the wider extension of modern dairying methods, a very great improvement in the quality of the local water supply, the establishment of complete coöperation between the Health Department and the Department of Streets and Wharves of the city in the collection and disposal of all trash and garbage and scavenging.

"The medical inspection of school children has been begun and the twenty-six rural schools of the county have already been inspected and a card index system, covering every rural pupil, is now a part of our record equipment."

The reports indicate that the community possesses a splendid health organization fully in touch with modern health methods and demonstrate to the "people of the city and county, the state and the South that governmental service can be rendered on a basis of maximum efficiency at a minimum cost."

Much credit is due to Dr. Charles T. Nesbit and his colleagues on the Board of Health. It is to be hoped that the people concerned realize the valuable asset they have in this group of scientific and enthusiastic servants.

✤

The Kentucky Sanitary Privy.—The May *Bulletin of the Kentucky State Board of Health* is entirely devoted to an extensive description and discussion of a privy of its own design, which promises to be "a practical solution of the problem of sewage disposal for homes, schools, railway stations, jails, and hotels, in unsewered towns and country districts."

After discussing the results of faulty and inefficient disposal of intestinal discharges, an efficient privy is described as, "uniformly safe in its operation; must cost so little as to be within the means of every one; must be simple in construction, fly proof, water tight, and have no unpleasant odor; must be largely self-operating so as to require little care and no handling of its contents," which requirements are fulfilled by the Kentucky privy.

There are several types of this privy, as most suitable to given conditions, but the essential features are as follows:

"The essential principles of the Kentucky sanitary privy are the tank, including the seat, the tile drain system, and the house, the only purpose of which is to screen the body. The house may be of any convenient type. Preferably, it should be well designed, and always screened. The seat should be comfortable. The lids must be well fitting to exclude insects. Again, for emphasis, we repeat that the tank and drainage system must be patterned exactly after one of the designs given in this *Bulletin*, if the best results are to be secured. Reference to the illustrations will indicate that the tank is practically a single solid rock, made of concrete, with three distinct chambers. The first, or receiving chamber, is open to the air. This is separated from the middle chamber by a concrete wall which comes within twelve inches of the bottom, allowing the liquid contents to flow from the first into the second chamber. The middle chamber is separated from the third by another wall which extends from the bottom to within eight inches of the top, and over which the contents of the tank flow intermittently into the third chamber. A tile or concrete elbow connects this third chamber with the drainage system. The roof of the tank forms the floor of the house, and the roof of the first chamber is taken up by the seat and lid. The second and third chambers are air-tight if properly constructed.

"After the concrete tank is completed and set, or hardened, it should be filled with water until it overflows into the tile drain. This water is then charged with our nitrifying germs or bacteria by pouring through the seat a coal-scuttle or two of black, moist, well-rotted horse manure. These nitrifying bacteria are now ready to liquefy any animal waste which is discharged into the

tank. They feed upon the bowel discharges, and destroy toilet paper of the right kind. Of course, no heavy paper, nor sticks, nor cobs, nor any substantial thing of that kind should be put into the tank under any condition at all. The animal discharges are liquefied in the tank, and as it passed through the drainage system it is changed into harmless plant food.

"The tile drainage system is important. Where it is impossible to secure tile, it may be built of rock, as shown later, and its purpose is to receive the overflow, and to allow the disposal and utilization of what has really become harmless but valuable fertilizer where it can do good."

Complete instructions are given for the construction of the several types described. At present the Board of Health estimates that about 99 per cent. of the privies in Kentucky are inefficient and dangerous, and urgently requests the speedy adoption of this privy in order to the sooner stop the spread of infectious diseases.

✠

Coöperation with Welfare Department.—The following brief notice appears in a recent monthly bulletin published by the Department of Health of Dallas, Tex. The necessity of full and active coöperation between the several divisions of a health department has long been realized, but too often it has gone no further. The Welfare and Sanitation Divisions of Dallas are now given an opportunity to share in experiences and to coöperate to their best advantage. It is to be hoped that the project will prove to be distinctly worth while.

"It is now well understood that in modern communities the social and economical aspects of family life are most intimately related to the sanitary condition of the home and its surroundings, and especially to the health of the individual members of the family. There is thus a direct connection between the activities of the social service workers, the sanitary inspectors, and the public health nurses, which should be taken advantage of in every way possible. With this in view the departments of Public Welfare and Public Health are planning to hold each month a joint meeting at which the social service workers may become better acquainted with the work of the sanitary inspectors and public health nurses, and *vice versa*. It is confidently expected that these meetings will result in an even greater coöperation between the two departments than exists at the present time, as well as in increased efficiency in many of their activities."

✠

The Foundation of Modern Medicine.—We quote below part of the introduction to the July *Health News* published by the New York State Department of Health. This excellent impression of the tendencies of modern medicine introduces descriptive discussions of the state laboratory service in an effort to demonstrate to the physicians of the state what the laboratories have done, and also to encourage a greater extension of laboratory facilities.

"The age of giants in medicine has passed into history and with it much of the romance of personality that formerly surrounded medical practice. The struggle of the keen intellects of by-gone days to penetrate the dark veil that enveloped the origin of disease, the shrewd guesses at what we now know to be the truth as well as the promulgation of many theories now known to be false, arouse our admiration and sympathy.

"The worship of individuality has given way to the elevation of mediocrity and to the advantage of the common welfare. In medicine, as in war, success lies not with the genius but with him who is able to make use of technical skill. This revolutionary change has been brought about by one agency—the medical laboratory—and allowing for the widest variation in the personal factors of intellect, training and devotion to duty, the modern practitioner is competent or incompetent in proportion to his general familiarity with and employment of laboratory methods of diagnosis and the institution of treatment which frequently depends upon them."

✠

New Law Provides "Dental Hygienists."—The Governor has just signed a bill which provides for the training, registration and licensing of dental hygienists. This marks the enactment into law of recommendations made some time ago to the Department of Health by one of its advisory committees. The committee's action was due to the great need for increased attention to the condition of the teeth of school children in New York, of whom, it is asserted, at least 90 per cent. require dental treatment.

A subcommittee, appointed to investigate the

matter, recommended the desirability of using dental hygienists and urged that a trial of the surface cleaning of children's teeth be made as soon as possible in one or more centers, preferably public schools, and that at the same time the children be given instruction in oral hygiene.

The new law provides that any dental dispensary or infirmary, legally incorporated and maintaining a proper standard and equipment, may establish for women students a course of study in oral hygiene. Such students shall present evidence of one year's attendance at high school, and after one year may be graduated as dental hygienists, upon complying with the preliminary requirements to examination. After satisfactorily passing the examination these students shall be registered and licensed as dental hygienists by the regents, under such rules as the regents may prescribe. Any licensed dentist, public institution, or school authorities may employ such dental hygienists, who may remove lime deposits, accretions, and stains from the exposed surfaces of the teeth, but shall not perform any other operation on the teeth or tissues of the mouth. The law follows the enactment of similar ones in Massachusetts and Connecticut, and it is expected that with the preventive steps made possible by the employment of such workers the condition of the teeth of the coming generation may be greatly improved.—*Health Bulletin*, New York City.

✱

Health Officers.—The following plea to allow health administration to transcend political favor is registered by the Wisconsin State Board of Health in its recent monthly *Bulletin*. In the reorganization of the local boards of health throughout the state, it is hoped that the full significance of such appointments will be realized.

"This is the season of the year when practically all the local boards of health throughout the state will be reorganized, and where the health officer or health commissioner has served for two years, a new health officer or health commissioner will be selected. It is the earnest desire of the State Board of Health that the local boards of health exercise every possible care in the selection of new health officers. If the present health officer has rendered satisfactory service, he should be retained in office if possible. A responsible position of this kind should not be passed around as a political favor as is done in so many places. The most competent and conscientious physician should be selected for the position as health officer and his compensation should be such that he will perform the duties of the office in an acceptable manner. The longer a good health officer is in office the more competent he becomes. There is no more important office in any township, incorporated village or city of this state than that of health officer, and we hope where a new health officer or health commissioner is to be selected, the best possible person for the place will be chosen."

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The Prevention of Typhoid by Vaccine.—The May *Bulletin of the Health Bureau of the City of Rochester*, New York, contains the following brief résumé of the efficacy of typhoid inoculation:

"In 1893, Fraenkel called attention to the use of vaccines in the prevention of typhoid. Subsequently it was taken up by Ross during the Boer War, and later by our own Russell, who shows that in 1914 of 92,000 soldiers of the United States army 35,000 were vaccinated and only seven contracted typhoid.

"During the comparatively short Spanish-American War there were more than 20,000 cases of typhoid fever among a little over 100,000 men, with 1,580 deaths. In the Boer War the English had 31,000 cases with 5,877 deaths. In the United States army there was, prior to vaccination, in 1908 and 1909, an average of 250 to 300 cases per annum on a mean strength of 74,000 to 84,000. After vaccination typhoid practically became a disappearing disease, and the records show but two cases per year in the two past years out of a total strength of 92,000 men.

"There can be no question but that typhoid vaccine has come to stay, and that the use of typhoid vaccine, intelligently pursued, will give a large number of immunes, a smaller number of cases and a very much smaller number of deaths. For it is to be remembered, that now typhoid fever is not (at any rate in the eastern part of the country) contracted so much from water supply as it is from the milk supply and from accidental food contamination, and, in all probability, from that contact which results from the

putting of the dirty fingers into the mouth. Typhoid fever is, therefore, a contagious disease.

"Vaccines—Typhoid vaccines are easy to get and not difficult to give, and the reactions attending them are not severe, not more than 2 per cent. of the vaccinated react severely. And, if one wishes to prevent the danger of a severe reaction attending the initial dose, he may, of course, split the initial dose, giving it in two doses instead of one. Or, he may split all the doses.

"The question, how long does a prophylactic vaccination remain good, is to be answered with some difficulty. People freshly vaccinated with vaccine rarely get typhoid, and they very rarely die of typhoid. But vaccination against typhoid offers a measure of protection that is nearly absolute. Its use is practically devoid of danger, and it offers protection, probably, for much longer than three years. Much work has been done to try to determine the length of time for which typhoid vaccine provides immunity. A positive Widal reaction is not always a good test for the length of immunity; for while the Widal reaction may disappear, the vaccinated person may still be immune to typhoid. Gay and Claypole, of the University of California, have been trying to devise a test for the determination of the duration of typhoid immunity. In 80 per cent. of the cases tested, their test was positive in freshly vaccinated persons and negative in those who had not been vaccinated."

*

Pure Water for a Million Californians.—A million people in California are drinking chlorinated water, according to the California State Board of Health. This means that one third of the population of the state is assured of a fairly safe water supply.

As a cheap and reasonably efficient method of removing the dangers due to the presence of typhoid and like germs, there is no form of treatment known at the present time that can compare with chlorination. The California State Board of Health has recommended and sponsored the use of this method of water purification for a great many of the water supplies of the state. Among the cities that have recently adopted this method are Los Angeles, Oakland, Sacramento, San Diego, Pasadena, San José, Eureka, Antioch, Benicia, Auburn, Pittsburg, National City, La Mesa, East San Diego, Santa Barbara, San Luis, Obispo, Monterey, Redding, Merced Falls, El Centro, Berkeley and Alameda. In addition, public swimming pools in Oakland and San Francisco are also chlorinated.

One of the most striking examples of the efficiency of chlorination in purifying water is shown in the experience of the city of Sacramento. In 1914, before chlorinating the water supply of that city, there were 253 cases of typhoid fever, while during the first six months of 1916, since the purification system has been installed, there were but eight typhoid cases reported.

The flexibility of chlorination plants is greatly in favor of this method, since it may be used for a supply as small as 100,000 gallons per day for a town like Merced Falls, with a population of 1,500, or for a supply of 10,000,000 gallons per day, serving a population of 180,000, as in the city of Oakland.

Forty chlorination plants are reported as already installed in Oregon, Washington, Arizona, Utah and New Mexico, while twenty-nine plants are now installed in California. The California State Board of Health is recommending this method of purification to all cities drawing their water supplies from questionable sources, and as soon as this method has been adopted in all cities of the state which draw their water supplies from such sources, there will, no doubt, follow great reductions in the communicable disease rates.

Public Health Notes.

Diphtheria in the First Year of Life.—It has long been noted that diphtheria has been comparatively rare at this period of life. Doctor Rolleston of London, England, writing in the *American Journal of Diseases of Children* presents an interesting study of such cases observed during the past fifteen years of the diphtheria patients admitted to the Metropolitan Asylums Board's Hospital. He summarizes the situation as follows:

"1. Diphtheria in the first year of life is comparatively rare. Only twenty patients at this

age occurred among a total of 2,600 diphtheria patients of all ages.

"2. Congenital syphilis is an important predisposing cause.

"3. Sixty-five per cent. showed some nasal involvement, with or without other diphtheritic lesions elsewhere, as compared with 25.6 per cent. in the total. Thirty per cent. were purely nasal, as compared with 1.5 per cent. of the total cases.

"4. The mortality was high, 45 per cent., as compared with 7.3 per cent. in the total.

"5. Paralysis was rare, two cases; bronchopneumonia, six cases, was common.

"6. A history of infection was obtained in only three cases."

The Medical Profession and Health Conservation.—The *Journal of the Florida Medical Association* for June, 1916, prints an interesting address of Dr. R. H. McGinnis in which he points out that:

"Much as has medical science done and is doing for health conservation, through its various avenues of instruction of the public, continued and strenuous effort is demanded. The public is rather slow to understand the necessary individual requirements that are conducive to good health. While a large portion of the misunderstanding is due to ignorance, there is also a large proportion due to indifference, carelessness and neglect. If this latter portion could be convinced and it acted upon its conviction, a great instructive force would be propagated that the resistance of ignorance could not prevail against. The human being is so constituted that he will take chances, especially with his health. He will speculate with it to a greater extent than with financial interests. He makes his body an exchange into which he puts various and sundry ventures, without proper consideration, trusting the body to produce a dividend on the investment. The body, constructed for emergencies, will respond for a time, but sooner or later its reserve is expended and collapse ensues. The damage is done, rejuvenation impossible and repair questionable. The measure of success in this propaganda of health conservation depends on the activities of the profession. The trend of the profession, at present, presages the ultimate eradication from its own ranks the incompetent and unqualified, and when the public support the profession's initiative, an era of health conservation will have advanced a long way. Education is the hope of success."

Cancer as a Non-Surgical Disease.—Dr. L. Ducan Bulkley, writing in the *New York State Journal of Medicine* for June, 1916, lays emphasis on the fact that:

"Cancer is not a surgical disease, although of late years cases of this nature have been almost always relegated to the surgeon. It is true that the local results of the cancerous process can be removed by surgical measures, and that the wound may heal primarily and that in some proportion of instances the tissues may remain sound. But the experience of all has shown that the mere removal of the cancerous tumor and adjoining tissues surgically does not insure that the disease will not return in or near the scar, or elsewhere. It is now recognized and acknowledged that somewhere about 90 per cent. of those once affected with cancer die from that malady. Surgery as a cure for cancer has been tried in the balance and found wanting."

Thus far in the study of cancer the points acknowledged may be mentioned under these heads:

"1. Clinically and experimentally cancer is shown to be not contagious or infectious; although under just the right conditions certain malignant new growths can be inoculated in some animals, but human cancer cannot be transplanted.

"2. Although micro-organisms of many kinds often have been found and claimed as the cause of cancer, there has been no concurrence of opinion in regard to them, and it is now pretty conclusively agreed that cancer is not caused by a micro-organism or parasite.

"3. Cancer is not wholly a result of traumatism, although local injury may have much to do with its development in some particular locality, even as in connection with late lesions of syphilis.

"4. Cancer is not hereditary in any appreciable degree; although some tendency in that direction has been demonstrated in certain strains of mice.

"5. Occupation has not any very great influence on the occurrence of cancer; although it is more frequent in some pursuits than in others.

"6. Cancer is not altogether a disease of older

years; although its occurrence is decidedly influenced by advancing age.

"7. It does not especially belong to or affect any particular sex, race, or class of persons.

"8. Cancer is not confined to any location or section of the earth, but has been observed in all countries and climates.

"Is it not, therefore, high time" says Doctor Bulkley "that serious attention be directed away from the purely surgical treatment of a symptom or result of a great disease, and that careful inquiry should be made into the underlying causes which ultimately result in such a great relative mortality, approaching 90 per cent. of all those affected, exceeding that of any other one disease?"

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The Physician as an Aid to Industrial Progress.—"Industrial progress is dependent primarily on health." This is the point developed by Dr. E. W. Warren in an interesting paper appearing in the June number of the *Florida Medical Journal:*

"No industrial enterprise attains its maximum success unless it makes reasonable provision for the health of its employees. Neither employer or employee is capable of his fullest activity when suffering from physical discomfort or is under the dread of disease. To do his best he must be a contented individual. He must not only be protected from disease and injury but his family must have every assurance that contagion and infection will be kept as far from them as possible. When the employee is assured that injuries received in performance of duty are to be properly cared for he will the more cheerfully put forth his best effort. His position at present demands more. He must know that every possible precaution is being taken to see that the hygienic and sanitary conditions surrounding his living quarters are the best and the health of his family provided for. Certain industrial enterprises at the present time are initiated by preliminary health surveys, the establishment of sanitary regulations and the removal or correction of unhealthful conditions before it is thought wise to begin operations.

"The gradual but increasing recognition of these facts has developed a new line of activity for the physician—that of taking care of the public health, or the health of the public. It is a broader field than that of treating the sick individual. It is an effort to keep individuals well *en masse*." . . . . . .

"The fight will be made and the victory won by hygiene. The enemies are the microbe and ignorance, the weapons are education, the sanitary inspector and health regulations. The sensational headline in the newspaper announcing the much dreaded yellow fever or bubonic plague, with its consequent business paralysis and economic loss, will be no more."

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Health Conservation through Life Insurance Companies.—"From the very start insurance companies have been in the lead in matters of general sanitation, hygiene and right living," writes Dr. John L. Davis in the Southern Medical Journal for July.

"The company's business success depends primarily upon the longevity of its policy-holders; therefore, the company is vitally concerned with everything that promotes health and prolongs life in the community—hygiene, sanitation, better homes, shorter working hours, improved machinery and safety devices, better education and training of men and women; in short, everything that tends to the human uplift—whether physical, intellectual or moral—interests insurance companies." . . . . . .

"In our warfare for human life conservation, the battle line before us presents four divisions for our attack:

"1. Diseases to a greater or less extent preventable and very disastrous, viz., consumption, typhoid fever and malaria, and to a less degree, hookworm, pellagra, ordinary diseases of childhood, etc.;

"2. Alcoholic liquors, which directly or indirectly cause a vast amount of sickness, death and economic loss;

"3. Occupational disease, leading to unnecessary sickness and death through various features such as atmospheric pressure, the gases engendered, the metallic poisons and dust, the overheated air, excessive fatigue, etc.; and

"4. Accidents, due to improper and unprotected machinery, tools, unsafe surroundings, etc."

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New Jersey Inviting Malaria.—"A practical hint to northern sanitarians may be found in a recent report by Major P. M. Ashburn, Medical

Corps, United States Army, concerning the tendency of malaria mosquitoes to follow human beings, even to great distances. The frequently mentioned flights at Gatun are proof of this.

"Major Ashburn went to the Canal Zone as general inspector of the Department of Health. He soon learned, from conversation with sanitary inspectors, that places which a few years ago, when populated, had been hot-beds of malaria and great breeding-places of *Anopheles* mosquitoes, now, since the inhabitants had moved elsewhere, have few or no *Anopheles*. And further, even the temporary camps of construction gangs have been known to bring malaria carriers into a neighborhood; the departure of workmen, it has been noted, was followed by a disappearance of *Anopheles*.

"One important demonstration of this habit occurred at a contractor's camp at Caño Saddle. The camp was opened in November, 1913, in a previously uninhabited location. Promptly the number of *Anopheles* began to increase, rising into hundreds during the four months of the camp's existence, abruptly dropping again when camp was broken, May 1. From the inspector's weekly record the following figures are taken:

Week Ending	*Malaria Carriers*
December 6, 1913	6
December 13, 1913	34
December 20, 1913	165
January 31, 1914	1,211
March 7, 1914	3,277
May 9, 1914	87

"By the middle of December the inspectors predicted malaria, though the first actual cases appeared only in the first week of February. On March 18, malaria was found in the blood of 9.7 per cent. of the workmen; on March 31, malaria was in the blood of 20 per cent.; the percentage was yet higher in April, when the adaptation between the malarial organism and its "host" had become established.

"'We are justified in stating,' concludes Major Ashburn, 'that, at Caño Saddle, a place highly favorable to malaria . . . *Anopheles* did not greatly abound until after the laborers had been there for three weeks or more, and malaria made no headway until after two months. It is probable that that uninhabited place was also uninhabited by mosquitoes capable of bearing malaria until the workmen took them there and created conditions particularly favorable for their breeding.'

"The problems of the Canal Zone are, it seems, in course of being imported into some hitherto malaria-free states. The demand for labor, especially in war industries, and the cessation of much of the work on the canal, have resulted in the migration of Mexican and negro workmen from Panama to the great explosives of New Jersey.

"This means that centers of malarial infection will almost undoubtedly be created in this state, for mosquitoes around and, wherever there are mosquitoes in this country, some specimens of *Anopheles* are found. Of late years they have been of no great importance in the North because the malarial organism was lacking; but now, human carriers of the organism are arriving on the scene and the chain will be complete.

"Years ago Robert Koch told the Italian government that the solution of the malaria problem in Italy lay in ridding the land of human carriers, since the mosquito could never be wholly eliminated. In consequence, Italy undertook an extensive free quinine treatment of her malarial population. The same situation will face New Jersey unless prompt preventive measures are taken."—*Survey*, July 22.

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The Rational Treatment of Tuberculosis.—Dr. August M. Kinney, in the July *Northwest Medicine*, presents an interesting study of the vaccine treatment of tuberculosis. He declares that this method is not associated with empiricism but, on the contrary, is based on absolute scientific facts and deductions. He arrives at the following conclusions as the result of a long experience in the treatment of tuberculosis:

"1. There is no treatment nor influence that is at all comparable with the effectiveness of the vaccine treatment (skillfully handled), in addition to proper dietetic and hygienic treatment in tuberculosis uncomplicated with other affections.

"2. Using the treatment above outlined with the patient under proper control, almost every case of incipient, a large number of moderately advanced, and many of the far advanced cases of tuberculosis can be permanently cured.

"3. The use of an appropriate autogenous vaccine as an adjunct to tuberculin has decided advantages.

"4. Tuberculin should be given with great caution by a physician well trained in vaccine and serum therapy and one who is a thorough examiner of the lungs.

"5. The doses of the vaccine heretofore used and recommended and the frequency of dosage should both be greatly reduced in order that the best results are obtained. Size of doses and intervals between doses can only be determined by a thorough study of each individual case. Begin with an exceedingly small dose and do not reinoculate until all time for reaction has passed. Success comes by guarding against the excessive stimulation of diseased tissue.

"6. While we do not in any way wish to deprecate sanatoria, it is our experience that the majority of cases amenable to cure respond equally as well if not better under a well regulated, routine, home treatment."

Rest and Exercise in Tuberculosis.—The place of both rest and exercise in the therapy of tuberculosis is discussed by Dr. Thompson Frazer in the July number of the *Southern Medical Journal*.

The chief points which he brings out in the paper are:

"1. That a thorough knowledge of the principles of rest and of exercise must underlie the treatment of tuberculosis.

"2. That neither exercise nor rest is to be prescribed off-hand, but that so long as there are symptoms pointing to an overworked body rest is indicated, the character and amount to be carefully prescribed; and that with improvement exercise slowly increased provides the safest means of regaining health and strength.

"3. That exercise must be very gradually increased, as a single act of overexertion may delay recovery months or years, or even make it impossible to attain.

"4. That the transitional period referred to should be continued under careful medical supervision until the patient is able to stand without harm more than he will be called upon to stand when he takes up active work.

"I believe that if these points are duly considered, and that if, instead of vaguely advising rest or exercise, we limit the amount and character of each with the aim of returning our patients to a condition in which they will be able successfully to cope with their changed environment, that in the future we shall hear less and less of relapses and shall be able to accomplish what should be our chief aim—an economic cure."

Appoint Committee on Activated-Sludge Process.—Members and associate members of the American Society of Civil Engineers interested in sewage disposal met informally June 28 in Pittsburgh to discuss various problems in connection with the treatment of sewage by the activated-sludge method. The report of the acting secretary, T. Chalkley Hatton, dated July 6, states that the time has not yet come for effecting a permanent organization to avoid duplication of experiments in the United States and Canada and preventing control of the activated-sludge process by patents issued without complete information having been submitted to the commissioner of patents. Believing that the best results could be obtained through a committee and personal service, F. A. Dallyn, provincial sanitary engineer, Toronto; George T. Hammond, engineer of designs, Borough of Brooklyn, New York City, and T. Chalkley Hatton, chief engineer of the sewerage commission, Milwaukee, were appointed to prepare standard definitions and other terms relating to the activated-sludge process of treating sewage. They will also tabulate and distribute a summary of work now being done or contemplated and suggest such correlation of current work as may be desirable.

The question of submitting to the commissioner of patents information relating to priority of knowledge of the activated-sludge process was left with Prof. Earle B. Phelps, H. W. Clark, George T. Hammond and Dr. Edward Bartow, with the understanding that all members present should assist by giving the commissioner all possible information in affidavit form.—*Engineering Record*.

A Message from the Grave.—We are indebted to a recent *Weekly Bulletin of the Cincinnati Department of Health* for the following additional bit of testimony against quackery:

"Under date of May 24 'Tanlac' advertisements appeared in Cincinnati, announcing in heavy type: '*He Gave Up Hope; Was Unable*

to Hold Job. Flora Street Man Had Kidney Trouble. Today Says Tanlac Restored His Health.'

"The man 'credited' with the 'testimonial' is described as a tailor with 'kidney trouble attended by severe pains in the back,' who 'had no appetite and was in a run-down condition'; who 'hardly ate enough to keep a chicken alive' and whose 'trouble came on like this': 'Several years ago I had an accident and my leg was broken in five places. This weakened me and I did not seem able to get over it. My health ebbing and ebbing to such an extent that I just gave up hope. Of course I gave up my job and was unable to work.'

"At this critical period he began to take 'Tanlac' and 'after taking several bottles of Tanlac' desires to say that, 'It is the greatest medicine on earth. It has given me back my health and with it my strength and vitality.'

"'*My old enemy—sore stiff back and pains—have entirely left me—entirely—did you get that? I eat and sleep good and feel better in every way.*' (The italics belong to the Health Officer.)

"Ordinarily the above statement would create very little in the way of comment, but when it is known that the testimonial came from a man *two days after his death*—'did you get that?'—then it is plain that we are bordering on the supernatural and that the Society for Psychical Research is due to take notice.

"Keep the dates in mind—testimonial appears May 24—death certificate on file in the Cincinnati Health Department shows that death took place on May 22.

"No wonder that 'my old enemy, sore, stiff back and pain, have entirely left me.' While there is room for reasonable doubt concerning the accuracy of the statement 'I eat good,' no one will question the accuracy of that other portion of the testimonial 'I sleep good.'

"The question naturally arises, 'Do the people financially interested in Tanlac "sleep good?"'

"The possibilities arising from a judicious employment of this remedy are respectfully referred to 'spiritualistic mediums.' Armed with a bottle of Tanlac the historic trumpet can be discarded entirely, or, better still, transformed into a useful dinner horn. Post-mortem testimony can be secured in murder mysteries and contested wills can have real light shed on obscure details. The possibilities residing in a bottle of this 'greatest medicine on earth' are not bounded by reason, experience, or the imagination. *Do the manufacturers of Tanlac really 'sleep good?'*"

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Out-patient Service Efficiency.—Lovell Langstroth, San Francisco (*Journal A. M. A.*, July 8, 1916), has analyzed 348 records of an out-patient clinic in which a uniform plan of questioning, testing, keeping records of visits, diagnose, references to other departments and results of treatment was adopted. The results are summed up in the following conclusions: "It is obvious from an examination of the preceding figures that the number of cases is too small to determine the value of the different laboratory procedures. They are merely suggestive and might form the basis of future investigation in which a larger number of cases could be considered with these points in mind. Certain facts are brought out, however, and the following conclusions seem justified: 1. Thirty-eight per cent. of the patients failed to return after diagnosis. The introduction of a follow-up system would decrease the percentage. 2. Eleven per cent. of the patients did not return a sufficient number of times to justify making a diagnosis. The institution of a department for preliminary examination of the patients is suggested in order to assign the cases to the proper departments and to eliminate those who come to the clinics for trivial causes. 3. There were twenty-seven cases, or 7 per cent. of the whole number, in which it was not found possible to make a definite diagnosis. 4. Seventy-five per cent. of the patients sent to the hospital for further examination or treatment had a correct admission diagnosis. 5. Much of the time lost in referring patients to other clinics for consultation might be saved by equipping the medical department for the commoner special examinations. 6. Only 38 per cent. of the patients in this series were benefited by their visits to the clinics. 7. Eighty-three per cent. of the patients did not return to the clinics after three months. I feel that those who have taken an interested part in out-patient work will agree that there is here the same need for careful attention to detail and effectiveness as in hospital work, but that this is rarely given. The figures show that this work, when considered from the point of view of the end-results, is disappointing, and

they are given with the hope of stimulating interest in out-patient work and raising its standard.

She Took no Chances.—The following amusing incidence, showing to what a ridiculous extent precaution may be carried, is given in a communication to the *New York Times:*

PARLOR CAR PASSENGER SPRAYED HER NEIGHBORS WITH DISINFECTANT.

To the Editor of The New York Times:

I was hardly seated in my parlor car chair on Monday on my way from New York City to Saratoga Springs when a young woman walked up to me and without a word of explanation or apology sprayed me with a vile-smelling disinfectant. Before I had time to protest she was half way down the car spraying everybody and everything as she passed. Two young men *en route* for Plattsburg were especially favored. Each of them was sprayed twice. When the entire car smelled like a hospital she returned to her seat opposite me, where her two little children were sitting.

"Yes," she said, in answer to the question of the mother of a small boy. "I, too, am leaving town because of the epidemic and I am taking no chances." Again she squeezed the bulb of the atomizer and I buried my nose in my handkerchief.

I. B. O.

Lake George, N. Y., July 12, 1916.

Campaign against Venereal Disease in the Army.—Fragmentary reports received from Europe show that the venereal diseases constitute one of the most serious and troublesome health problems for the military health officers of the nations engaged in the great war. The same problem has existed and been recognized in our own army, but now assumes greater importance in consequence of the mobilization of our national guard troops and their assembling on the Mexican border and in various state camps. There is grave warning of impending danger in the reports of the ravages of these diseases at the time of the Spanish War and of their spread among the civilian population when the military organizations dispersed at its close.

With these lessons in mind, the American Social Hygiene Association is seeking to cooperate with national and state military authorities, with the Y. M. C. A., and with state and local social hygiene societies in educational and medical measures to prevent and control venereal disease among the regular and national guard troops. Plans for this work are not yet fully worked out, but they include both preventive efforts through the use of special printed matter, by social and recreational agencies, and by the repression of prostitution in the vicinity of the camps, and also remedial measures for prompt and adequate diagnosis, treatment, and control of all venereal infections.

Industrial Hygiene and Sanitation.

The following, appearing in the *Travelers' Standard* for July, is, because of its general interest, repeated here in full:

"RESUSCITATION.

"A prominent physician in a large city has said that 'if all the physicians of the city were called to attend a case of suspended animation from electric shock, 90 per cent. of them would be at a loss as to how to proceed.' This may correctly describe the state of affairs in some particular city, but it is probably too broad and sweeping to fairly represent the medical profession as a whole. If the statement were applied to the adult population of the entire country, however, it would no doubt be very conservative; for we are inclined to believe that less than 1 per cent. of the general public have the necessary knowledge.

"If this estimate is anywhere near correct, it follows that many lives are unnecessarily lost, merely because persons who witness an accident from electric shock and who have the physical ability to render effective aid, do not know what to do. The same is true of drowning also, and now that the vacation season is at hand, we may expect to hear the usual number of reports of drowning accidents, and of lives lost through lack of information as to how to proceed to resuscitate an unconscious person, or 'bring him

back to life.' It appears to be desirable, therefore, notwithstanding the many articles that have already been written on the subject, to refer again to the various methods of resuscitation, so that those who cannot immediately command expert assistance may be enabled to meet an emergency of this kind intelligently.

"Unconsciousness brought about by immersion under water, or by electric shock, or by exposure to gas or smoke, need not terminate fatally, if immediate efforts are made to restore and promote respiration; but there must not be the least unnecessary delay if the efforts to revive the affected patient are to be successful. Resuscitation may in fact be classed as 'first and final' aid, and in this respect it differs radically from 'first-aid' treatments as applied to injuries. A workman suffering from a fractured bone, or from a burn, cut, or laceration, may receive first-aid treatment, including dressing and bandages, and these, if properly applied and administered, will relieve suffering, prevent infection, and assist in recovery; but even if first-aid materials are not available, or if those that are at hand are not put to proper use, the patient's life is not necessarily endangered. As soon as proper medical aid is administered, the harm due to the lack of first-aid treatment, or to unskillful manipulation by untrained persons, may often be checked or counteracted, and a start for recovery made. The likelihood of rapid recovery under unfavorable conditions of this kind is not so promising as it would have been if proper first aid had been given, and yet a patient suffering from minor bodily injuries is ordinarily in no immediate danger of death, and he has a good chance to recover, if errors and omissions in treatment are corrected without protracted delay.

"But a person in a state of suspended animation has only one chance for his life, and that consists in making immediate and properly directed efforts to supply his lungs with oxygen by means of artificial respiration. There must not be the least delay, or the sufferer will die—not from his direct injury, but from asphyxiation or 'suffocation.' To send for a physician and an ambulance, and then wait for them to arrive without striving to restore respiration in the meantime, is almost certain to result fatally; and if the bystander can do no more than this, it might be more logical for him to merely notify the coroner's office of the accident and the physician alone, for the physician's sole duty in practically every such case is likely to consist in pronouncing the patient dead.

"Except in exceedingly cold weather, it is not necessary to move the patient to warm quarters, although it is important to keep him warm as is consistent with the immediate establishment of respiration, which is the first thing to attend to under all circumstances. The advantages gained by carrying a victim of a drowning accident to a house or hotel are absolutely insignificant in comparison with the disadvantage of the delay consequent in starting artificial respiration, for a very slight delay will often determine whether success or failure will attend the efforts to revive the patient.

"There are three prominent methods of resuscitation by inducing artificial respiration, which are respectively known as the prone-pressure or Schafer method, the Sylvester-Laborde method, and the automatic or mechanical methods typified by the pulmotor, lungmotor, and other mechanical devices. Certain advantages are claimed for the prone-pressure method as compared with the other two, and one of its most important features is its simplicity. Only one adult operator is required, and he can carry on resuscitation efforts for several hours without undue fatigue. With this method there need be no delay for procuring apparatus or extra assistance. In the average case, the patient may be placed in the proper position, and artificial respiration actually begun, in thirty seconds. The patient should be laid face downward, and his arms should be drawn forward, parallel to his body, so that they will lie close to his head. His face should then be turned to one side so that neither the mouth nor the nose can touch the ground, and his mouth and throat should be carefully freed from mucus or other foreign matter by inserting a finger. The operator should kneel astride the patient's thighs, and facing his head. The palms of the operator's hands should be placed on the loins or the muscles of the small of the back, with the thumbs nearly touching each other, and with the fingers spread over the lower ribs. The operator should hold his arms straight, and should gradually swing his body

forward so that his weight is brought to bear upon the patient. This should take two or three seconds for an adult patient, and the pressure should be applied gradually as already explained. Sudden and violent application may cause internal injuries. The purpose of the operation is to raise the contents of the abdominal cavity, and to compress the lower part of the chest, thus forcing air out of the lungs. The operator should then immediately swing backward, thus removing the pressure. The lower chest walls will then expand from their own elasticity, and the organs of the abdominal tract will also tend to return to their normal position, so that air will be drawn into the lungs. After an interval of one and a half or two seconds the entire operation should be repeated, and the treatment should proceed in this way, until natural respiration occurs, or until it becomes certain that further efforts are useless. It will thus be seen that a complete resuscitation should be made every five seconds, or at the rate of twelve per minute. It is important that this rate of respiration should not be greatly exceeded, as might easily occur because of the excitement, and over-anxiety to aid the patient; and it is also important that the pressure be applied firmly and regularly, so that the natural act of breathing may be imitated as closely as possible.

"If there are any other persons about, one of them should be dispatched at once for a physician, and in the meantime artificial respiration should be continued without interruption until natural breathing is restored. If necessary this treatment should be continued for at least two hours with a victim of electrical shock, and respiration has been restored in drowning accidents after three or more hours of uninterrupted efforts. These facts should be remembered, because after working for half an hour or an hour without any sign of returning consciousness or natural respiration, the uninitiated operator might assume that further efforts would be useless, and this would be a great mistake. From the nature of the case there can be no authentic statistics as to the lives lost through premature cessation of artificial respiration, for the victims are gone and they cannot come back to testify or show that they would have revived if the treatment had been continued for ten, twenty or forty minutes more. It is wisest to continue the efforts until a physician comes, unless his arrival is delayed for four or five hours.

"If several persons are present they may best render assistance by keeping well away from the patient, although one of them may advantageously loosen the victim's clothing, particularly about the throat and chest. Others may scour the neighborhood for warm blankets or hot water bottles, with which to protect and warm the patient's body and limbs; but nothing should be done to hamper the effective and regular work of the operator who is endeavoring to restore respiration. A cloth, saturated with aromatic spirits of ammonia (if this can be obtained easily) and held near the nose, is an excellent respiratory stimulant, but it is useful only in connection with artificial respiration. No liquids should be administered to the patient until he has fully recovered consciousness.

"The Sylvester method requires the patient to be laid on his back with a folded coat or some similar thing under his shoulders. In applying this method the tongue must be drawn out and held by a pair of tongue forceps, or gripped by the fingers by means of a dry cloth or towel, so that it cannot fall back into the throat and check the entrance of air into the lungs. The patient's arms are then moved up and down so that they alternately enlarge and compress the lung cavity, thus causing air to enter and leave the lungs. It is evident that two operators are necessary, one to hold the tongue and the other to manipulate the arms. Experience has shown that this method of artificial respiration quickly tires the operator, who is likely to give up from fatigue before it is certain that all further efforts are useless. It is advisable to study the subject of artificialr espiration before the emergency occurs, and to take personal lessons in the art from a competent instructor rather than to learn how to proceed by reading books or articles about it. This advice is particularly applicable to the Sylvester method, the effectiveness of which depends largely upon the way in which the arms of the patient are moved.

"The relative merits of both of the foregoing methods have been set forth many times, and the opinions of various commissions and investigators are so conflicting that one is left in doubt as to their relative value. From the

results published the conclusion may be justified that the variation in tidal air-flow is due not so much to the superiority of one method over the other, as to the skill of the operator. The Schafer method is comparatively easy to learn and execute, and requires only one person to apply it, and for these reasons its use is increasing.

"As stated at the outset, the object of this article is to direct attention to simple methods of resuscitation—methods that can be applied on the spot without any auxiliary equipment. If a good mechanical device for resuscitation is available, it is desirable to use it instead of depending on the Sylvester or Schafer methods. The pulmotor, a device consisting of an oxygen tank, tubing, and simple controlling arrangements, is automatically operated by the pressure of the oxygen in the tank. The lungmotor is a hand operated device, by which either air or oxygen can be administered. Both of these machines are in general use, and they have proved their value many times by restoring persons who have been overcome by gas, smoke, or electricity, or by submersion under water."

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Industrial Welfare Number of "The Modern Hospital."—The August number of *The Modern Hospital*, St. Louis and Chicago, is devoted to a symposium on welfare work among the industrial corporations of the country. There are editorials by those competent to write on this important subject, a great number of papers written by welfare directors in some of the most important industrial corporations, and an immense amount of statistics and figures and facts showing the huge volume of work that the corporations are doing to protect their employees against sickness, accidents, and discontent. The journal contains many illustrations of first-aid stations, emergency hospitals, and welfare departments of industrial plants, and many facts that should be of great help to those interested. Among the topics discussed are those of first aid, industrial nursing, lunches and diets for industrial employees, safety devices in factories, and athletic and social clubs for employees. The editors frankly state that they have been unable to obtain figures as to cost of welfare work in the industries, but a number of writers attempt to make deductions and draw conclusions from their experiences of the past few years.

The Modern Hospital divides welfare work into three phases:

1. To make employees healthy, comfortable, and happy, in order that they may achieve the highest efficiency in their work.

2. To help employees prepare for the day when they are prevented from being bread winners, so that dependents on them may be provided for in case of sickness or disability.

3. To provide entertainment, recreation, and interesting groupings, in order that the employees of the corporation may have mutual interests which will enhance their loyalty and team-work.

Some able writers have discussed the various features of welfare work for the different branches of industry, as, for instance, Dr. Thomas Darlington, former health commissioner of New York and medical director of the American Iron and Steel Institute, discusses the present scope of welfare work in the iron and steel industries. Dr. Samuel Lambert writes on provision for medical care under health insurance, and Dr. S. S. Goldwater, formerly health commissioner of New York, has an editorial on the conservation of health of industrial workers. Welfare work in the public utility corporations is discussed by Mr. H. H. Vreeland, general manager of the Interborough Rapid Transit Company, New York. Mr. James Prentiss Duncan discusses welfare work in the telephone and telegraph corporations. Mr. H. G. Kobick, manager of the employment department of the Commonwealth Edison Company, discusses welfare work in the electric lighting corporations. Mr. S. F. Moore discusses welfare work among the gas corporations. There are stories of welfare work in such department stores as Wanamaker, Macy's, Marshall Field's, and similar great concerns. Mr. G. A. Ranney, secretary, discusses welfare work of the International Harvester Company. Mrs. Anne Kendrick Walker discusses welfare work among the clothing and suit manufacturers. A representative of Armour & Company writes on the subject of welfare work in Packingtown, Chicago. Besides many more of these special papers, there is an epitome of welfare work in hundreds of the corporations of the country.

Perhaps the best feature of the industrial

number of *The Modern Hospital* is the attempt on the part of the editors to weed out those features of industrial welfare that they believe undesirable and to emphasize those that seem to best meet the present needs of the American public.

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The Association of Government Labor Officials of the United States and Canada, comprising labor commissioners, industrial inspectors and experts on industrial hygiene, met in annual convention at Buffalo, during July.

A large part of the time of the convention was given over to the discussion of safety measures and the question of raising the health standard in mills, shops and factories.

One of the speakers stated that the state of Missouri appropriated, during 1915, $600,000 for the protection of wild game and at the same session of the legislature provision was made for a fund of $15,000 to see that the employees of the mines of the state were given adequate protection in the way of safety devices and sanitary measures.

The key note of the convention was contained in the address of the State Labor Commissioner of Missouri, John T. Fitzpatrick:

"Industrial preparedness means adequate and equitable provisions for the health, safety, welfare and well being of our toilers, whether they be in the mill, mine, factory, work shop, railroad or field. It means that our natural resources will provide conditions for the toiler permitting him to become proficient in the performance of an active citizenship, interested in the well being of others and in a good, stable, virile government."

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Increase in Michigan Accidents.—Big increases over the first six months of the year 1915 are shown in the report of the Industrial Accident Board for the first six months of 1916.

The total number of accidents for the first half of 1915 is 6,219 while the last six months show 9,569. The total compensation paid in 1915 amounted to $584,550, while this year it has been $804,369.

"The large increase in the number of accidents," says Secretary Gilbert W. Dickson, in an explanation of the figures, "is directly due to the increased number of employees at work in the various industries of the state. The industries of the state vary in character and furnish a sufficiently broad field for the law of average to operate on, so that the fluctuation in the number of accidents from time to time directly represents the proportionate number of persons at work in the various industries."

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Firms May Hire Physicians.—In the monthly bulletin of the Pennsylvania Manufacturers' Association, just issued, there is a lengthy discussion of the proposition of the physician in industry. As a direct consequence of this article it is likely that the matter of medical supervision in factories will be discussed thoroughly at the annual meeting of that organization.

Since the Workmen's Compensation Law became operative the employer has been responsible for the payment of the fees of the physician in the case of an accident to employees "in the course of their employment." They have the right to designate this physician and the step presented to them in the current bulletin carries that proposition a step forward.

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Prosperity and Accidents.—According to the *Milwaukee* (Wis.) *Wisconsin*, prosperity, high wages and plenty of employment in Wisconsin industries has had a definite effect on the volume of work in the office of the industrial commission which administers the Workmen's Compensation Act and all other labor laws. Figures for June show nearly twice as many accidents as June of last year.

The commissioner's statisticians say that there has been an increase of 64 per cent. in the number of accidents reported in the first five months of 1916 as against the first five months of 1915. This abnormal increase is explained by the existing normal industrial conditions. Factories are working night and day, and in some cases three shifts are working where only one shift worked before the boom in war materials.

Employment of unskilled labor, neither speaking nor understanding English, is given as the direct cause for the increase in accidents.

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Standardization of Safety Regulations.—The Committee on Safety and Sanitation of the American Foundrymen's Association met in Rochester during July and prepared safety

regulations which are to be standardized for all the states.

Mr. Victor T. Noonan, State Industrial Safety Director of Ohio, is chairman of this committee. The principal recommendations of the committee briefly are as follows:

"All workmen must report injuries promptly to their employer, particularly minor hurts, such as scratches and slight cuts.

"The use of peroxide for first-aid treatment is prohibited on the ground that it is not reliable. Iodine is to be used in its stead.

"The use of liquor by foundry workers during working hours is prohibited and it is to be discouraged outside of working hours. Employers and heads of departments are urged to set the example of sobriety to their employees.

"Workshop rules must be strictly enforced. Shop discipline is most necessary in accident prevention.

"Foremen in all foundries must take a personal interest in accident prevention and set an example of carefulness to their men.

"Employees should organize safety committees among their workmen and use the following educational methods—prize contests, suggestion boxes, bulletin boards, motion pictures and safety meetings. Seventy five per cent. of the accident reduction so far has been accomplished by educational work.

"All drinking cups should be abolished, and sanitary drinking fountains installed in their place."

*

Residence for Department Store Employees.—The firm of Jordan, Marsh & Company of Boston has given over for the use of their employees a country home situated in Wenham, some twenty miles from the city.

The new venture is intended primarily for employees needing a change of air, and not as a country club. Employees of the store in need of rest or convalescing from illness may recuperate among the most pleasant surroundings.

Gratifying results have been obtained during the short time since the house has been thrown open. For those cases, however, of prolonged convalescence, Lyons Farm, Billerica, is still used by the firm.

Coke Oven Accidents in 1915.—Reports received from the operators of coke ovens show a gratifying decrease in the number of fatalities and injuries during the year 1915 as compared with 1913 and 1914. The number of men killed in 1915 was 38 as compared with 45 in 1914, and 46 in 1913. The total number of men reported employed for 1915 was 31,060 as compared with 22,313 in 1914. The fatality rate in 1914 was 2.02 per 1,000 while in 1915 it was 1.22. The injury rate in 1914 was 98.10 per 1,000 while in 1915 it was 91.82 per 1,000 men employed. Of the total number of non-fatal injuries, none were reported as causing permanent total disability, while 50 were reported as causing permanent partial disability. The report represents 248 plants or companies showing 55,112 ovens in operation as compared with 49,895 in 1914. Some companies rendered combined reports for several plants so the exact number of plants is not known. There were also reported 98 plants idle. The average number of days active in 1915 was 303 as compared with 286 in 1914, and 288 in 1913. Although the accident figures thus collected are not quite complete for the entire industry, yet they are sufficiently representative to point out some of the principal hazards of the industry.

The report gives for the first time separate accident data for beehive and by-product ovens and indicates a greater hazard for the latter than the former.—Albert H. Fay in *Safety Engineering*.

*

Pension Fund for Employees.—Swift & Company of Chicago announced in July that it had established a pension fund for its employees with a foundation of $2,000,000. The fund, the accumulation of six years, will benefit employees of the company throughout the country. It is stated that more than 30,000 men and women are eligible to come under its provisions.

One of its features is that employees do not contribute to it, the company furnishing all the money necessary to pay pensions. In this connection, the company says it expects to be called upon to pay $400,000 a year in addition to the income from the fund, in order to meet the demands. Pensions are limited to a minimum of $240 and a maximum of $5,000 a year. In Chicago alone 8,000 persons will come under the

plan as outlined. A pension board has been organized consisting of five members, who are officers or employees of Swift & Company.

✱

Dormitories for Women Employees.—The Remington Arms Company of Bridgeport, Conn., have built and equipped for their female employees four large dormitories, each of sixty-nine rooms. These dormitories will be conducted on the plan of a hotel and will include many provisions for the comfort and convenience of their occupants.

✱

Factory Athletic Director.—The Wagner Electric Manufacturing Company of St. Louis is to employ an athletic director for the 3,500 persons employed in its four plants. The company will employ an experienced athlete who will devote part of his time to factory work and part to athletics.

The athletic director will also be expected to instruct the plants' workers in hygiene and the care of the body.

✱

A Good Record.—For the first six months of this year the Pennsylvania Railroad System carried 92,380,184 passengers without killing one in a train accident. This rounds out a two-and-one-half years' record of similar safety, during which 453,952,298 passengers were carried. They rode in 3,000,000 trains for a total of over 10,000,000,000 miles.

✱

The Aluminum Company of America has at the expense of $15,000 built at New Kensington, Pa., a ball park for the use of its employees. At night the company employs the park in showing free moving pictures to employees of the company and their families.

✱

According to the workmen's compensation report of Pennsylvania there are now in that state 22,900 persons who are receiving semi-monthly payment as a result of the enactment of the Workmen's Compensation Law.

✱

A case of anthrax in an employee of a leather company has been reported from Camden, N. J. The employee is said to have contracted the disease while handling raw hide.

Personal Notes.

Dr. Henry Hanson has severed his connection with the State Board of Health of Florida and is now engaged in private laboratory work. Dr. E. G. Birge has succeeded Doctor Hanson and is in charge of the Central Laboratory of the State Health Department.

✱

Dr. Arthur A. Brown and Dr. Francis A. Finnigan have been appointed district health officers of the Massachusetts State Department of Health.

✱

The degree of doctor of science has been conferred on Dr. Ludvig Hektoen, director of the Memorial Institute for Infectious Diseases, Chicago, by the University of Wisconsin.

✱

George W. Fuller, consulting engineer of New York City, has been awarded the Edward Longstreth medal of merit by the Franklin Institute, Philadelphia, for his paper on "Biochemical and Engineering Aspects of Sanitary Water Supply." The paper, which was published in the *Journal* of the institute in July, 1915, was a comprehensive description of practical means of measuring the sanitary quality of water supplies.—*Exchange.*

✱

James L. Tighe, consulting hydraulic engineer, of Holyoke, Mass., has been engaged by the board of public works to assist in estimating the value of the Springfield waterworks. Mr. Tighe was connected with the Holyoke engineering department for nineteen years, and resigned to engage in consulting practice about six years ago.—*Exchange.*

✱

Arthur Lederer has resigned as chief chemist for the Sanitary District of Chicago to study the course for health officers at Harvard-Technology.

The International Health Commission of the Rockefeller Foundation announces the change of its name to International Health Board of the Rockefeller Foundation.

The following persons were elected to membership in the American Public Health Association, July 17:

Alfred Katz, 21 Besse Place, Springfield, Mass., Massachusetts State Board of Labor and Industry.

William W. Peter, Shanghai, China, Secretary, Joint Council on Public Health Education of the National Medical Association of China.

E. B. Johnson, Watertown, Mass., Agent, Board of Health.

William J. Graf, M. D., Cincinnati, Ohio, Physician and Surgeon.

Frank H. Stadtmueller, Elmwood, Conn., Town Health Officer, State Dairy and Food Commissioner.

Abram W. Harris, New York, N. Y., Secretary, Board of Education, Methodist Episcopal Church.

Charles Davison, M. D., Chicago, Ill., Surgeon.

William B. Palmer, Health Dept., Orange, N. J., Milk Inspector of the Oranges.

Edmund T. Perkins, M. A., C. E., Chicago, Ill., Consulting Engineer.

William A. Pusey, M. D., Chicago, Ill., Physician.

Albert Scott Gray, M. D., Chicago, Ill., Physician, Editor, Health Department, Chicago Daily News.

S. V. del Rosario, M. D., Manila P. I., Chief of the Division of Sanitation of the City of Manila, Philippine Health Service.

Frederick Epplen, M. D., Spokane, Wash., Physician.

Current Public Health Literature.

AMERICAN.

Boston Medical and Surgical Journal.

CLXXV. July 6.

The Menace of Syphilis of Today to the Family of Tomorrow. J. H. Blaisdell.

July 13.

Certain Occupations as Contributing Factors to Diseases of the Skin. Charles J. White.

July 20.

Epidemic Poliomyelitis. The Symptomatology and Diagnosis in the Acute Stages. F. R. Fraser.

Anatomic Form and Posture, Important Factors in the Treatment of Pulmonary Tuberculosis. J. E. Goldthwait.

The Teaching of Therapeutics as a Branch of Applied Physiology. F. H. McCrudden.

July 27.

Common Sense and Consumption. John B. Hawes, 2d.

Cleveland Medical Journal.

XV. June.

The Enzyme Theory of Life. Leonard T. Troland.

Engineering News, New York.

76. June 22.

Grit Chamber and Pump Station, Albany Sewage-Works. I. John H. Gregory.

June 29.

Proper Methods of Testing Water-Work's Pumps. L. A. Day.

Grit Chamber and Pump Station, Albany Sewage-Works. II. John H. Gregory.

July 15.

Kansas Experience in Running Small Sewage Works. F. M. Veatch.

July 20

Air-Diffuser Experiences with Activated Sludge Tanks (Symposium).

Interstate Medical Journal, St. Louis, Mo.

XXIII. July.

Sputum Cultures with Subsequent Complement Fixation Control. W. W. Williams and Ward Burdick.

The Report of Twelve Cases of Pellagra and Its Relation to Mental Disease. Mary O'Malley.

Journal of the American Medical Association, Chicago.

LXVII. July 8.

Standards for Determining the Suitability of Patients for Admission to a Free Dispensary. Borden S. Veeder.

A Critical Analysis of Out-Patient Work from the Point of View of Efficiency. Lovell Langstroth.

Immunity Conferred by the Transfer of Immune and Sensitized Serums. H. Sewell, W. C. Mitchell, C. Powell.

July 22.

The Nature, Manner of Conveyance and Means of Prevention of Infantile Paralysis. Simon Flexner.

Journal of Bacteriology, Baltimore.

I. July.

Biological Variations of Bacteria. I. M. R. Smirnow.

A New Culture Medium for the Tubercle Bacillus. W. W. Williams and Ward Burdick.

Bacillus Abortus (Bang) as an Etiological Factor in Infectious Abortion in Swine. E. S. Good and W. V. Smith.

The Relation of Protozoa to Certain Groups of Soil Bacteria. T. L. Hills.

A Study of the Boas-Oppler Bacillus. P. G. Heineman and E. E. Ecker.

A Contribution to the Bacteriology of Silage. J. M. Sherman.

Journal of Experimental Medicine, Baltimore.

XXIV. July.

Immunity Factors in Pneumococcus Infection in the Dog. C. G. Bull.
Further Observations on the Agglutination of Bacteria in Vivo. C. G. Bull.
The Agglutinability of Blood and Agar Strains of Typhoid Bacilli. C. G. Bull and I. W. Pritchett.
A Final Report on the Cultivation of the Tubercle Bacillus from the Sputum by the Method of Petroff. R. A. Keilty.
Variations in the Pneumococcus Induced by Growth in Immune Serum. Laura M. Stryker.
The Conditions and Characters of the Immunity Produced in the Guinea Pig by Instillation of Horse Serum into the Nose. H. Sewall and C. Powell.

Journal of Infectious Diseases, Chicago.

19. July.

A Study of Various Methods for Determining the Virulence of Diphtheria Bacilli. J. A. Kolmer and E. L. Moskage.
A Study in Acid Production by Diphtheria Bacilli. E. L. Moskage and J. A. Kolmer.
The Relation of the Carbohydrate-Splitting Ferments to the Soluble Toxins of Diphtheria Bacilli. J. A. Kolmer and E. L. Moskage.
The Protein-Sparing Action of Utilizable Carbohydrates in Cultures of Certain Sugar-Fermenting Organisms. H. M. Jones.
The Antigenic Value of Spirochæta Hyos in Complement Fixation Tests on Hog Cholera Sera. W. E. King and R. H. Drake.
Antibodies after Antityphoid Inoculation. Katherine Howell.
The Effect of Benzene on the Production of Antibodies. Ludvig Hektoen.
The Time Relation of the Infiltrating Cells in Acute Anterior Poliomyelitis. A. E. Taft.
Yeasts, Probably Pathogenic, in Throat Cultures. A. L. Grover.
Observations on Phagocytosis and Leukocytic Activity in Diphtheria Carriers. Ruth Tunnicliff.

Medical Times, New York.

XLIV. July.

A Prohibition Era—Is it Coming and Should We Welcome It? O. W. Ehrhorn.
The Pathology of Syphilis (concluded). F. E. Gardner.
A New View of Alcoholic Degeneration. T. D. Crothers.
The Present Scope of Medical Jurisprudence. Theodore Sutru.

Modern Hospital, St. Louis.

VII. July.

Nature, Value and Necessity of Team-Work in a Hospital. C. H. Mayo.
Safeguarding the Hospital's Most Valuable Food—Milk. C. E. North.
The Small Community Hospital—Its Finances. J. A. Hornsby.
The Community's Obligation for the Care of Its Indigent Sick and Injured. F. S. Bunn.

Northwest Medicine.

XV. July.

The Rational Treatment of Tuberculosis. A. M. Kinney.
Government Control of Medicine and the Prevention of Quackery. Edgar L. White.

Public Health Journal, Toronto.

VII. July.

Alcohol from the Public Health Standpoint. J. W. S. McCullough.
The Attitude of the Psychiatrist toward Alcoholism as a Cause of Insanity. C. K. Clarke.
The Royal Institute of Public Health—A Historical Survey. A. Corbett-Smith.
The Mother in Industry. John Martin.

Public Health Nurse Quarterly, Cleveland.

VIII. July.

Public Health Nursing—A Municipal Duty. C. E. Terry.
Municipal Nursing—Some of Its Problems. Margaret F. Sireh and Edna L. Hedenberg.
How Public Health Nurses Can Aid a State Department of Health to Extend Its Program of Health Conservation. R. G. Paterson.
Health Insurance and Public Health Nursing. Olga S. Halsey.
Standardization of Financial Statements for Visiting Nurse Associations. Lee K. Frankel.
Relation of Overhead to Staff Expenses. Anna M. Huber.
A Financial Program which Includes and Anticipates Public Subsidy. Mrs. J. W. Cunningham.
Public Health Nursing in Rural Districts. Mrs. W. N. Hutt.
Rural Tuberculosis Nursing. Elizabeth Leenhauts.
The Training School's Responsibility in Public Health Nursing Education. Katherine Tucker.
Eighteen Months' Field and Dispensary Work with Syphilities. Margaret Tupper.
The Mental Hygiene Movement and Preventive Measures. Elnora Thomson.
A Series of Talks on Public Health Nursing. Mary Beard.

Safety Engineering, New York.

XXXII. July.

Personal Hazards. F. H. Elam.
The A, B, C, of "Safety First"—Always Be Careful. Fred Koenig.
Chemical Paper Making—The Process, Hazards and Precautions to Be Observed. R. L. Morrow.
Elevator Hazards and their Elimination. R. W. Hicks, Jr.
United States Steel Corporation's Work in Accident Prevention. C. L. Close.

Southern Medicine, Birmingham.

IX. July.

Common Sense and the Fever Thermometer *v.* the Stethoscope and the Microscope in the Diagnosis of Early Pulmonary Tuberculosis. S. E. Thompson.
Rest and Exercise in Tuberculosis. Thompson Frazer.
Health Conservation through Life Insurance Companies. J. L. Davis.
What Life Insurance Companies Can Do for the Betterment of the Public Health. M. M. Smith.
The Relation of Insurance Medicine and Periodical Health Tests to General Practice. W. O. Pauli.

Trained Nurse, New York.

LVII. July.

What is Meant by Hospital Efficiency and Some of the Factors Which Are Often Responsible for Lack of Efficiency. Winford H. Smith.
Practical Points in Mental Nursing for the General Nurse. H. W. Keatley.
Occupational Therapy and the War. G. E. Barton.

August.

Public Health Nursing and Tuberculosis. Otto R. Eichel.
Practical Experience in an Epidemic of Typhoid. Anna L. Smith.
An Essay on Personal Hygiene. M. G. Bellamy.

United States Public Health Reports.

XXXI. June 30.

Directory of City Health Officers of Cities Having a Population of over 10,000 in 1910.

July 7.

Pork and Trichinæ.
Smallpox in Porto Rico in 1916. W. W. King.
Public Health Administration in Nebraska. Carroll Fox.

July 14.

Poliomyelitis—What Is Known of Its Cause and Modes of Transmission. Wade H. Frost.

July 21.

Hay Fever and Its Prevention. W. Scheppegrell.
Health Insurance. Report of the Standing Committee Adopted by the Conference of State and Territorial Health Authorities with the U. S. P. H. Service.

BRITISH EMPIRE.

British Medical Journal, London.

I. May 27. No. 2891.

Louse Problem on the Western Front. A. D. Peacock.
Simple and Inexpensive Methods for Fermentation Tests and for Obtaining Cultures of Anærobes. J. M. Beattie.

June 3.

Louse Problem on the Western Front. A. D. Peacock.
Best Methods of Destroying Lice and Other Body Vermin. J. P. Kinloch.

June 10.

Spirochæta Eurygyrata, as Found in Human Feces. H. B. Fantham.

Journal of State Medicine, London.

XXIV. July.

The Rapid Production of Antidysenteric and Antimeningococcic Sera. Simon Flexner.
The Care of Children under School Age. A. S. M. Macgregor.

Lancet, London.

CXCI. June 24.

On the Agglutination Reaction of the Bacilli of the Typhoid-Dysentery Group with Normal Sera. T. R. Ritchie.
Annual Report for 1914 of the Registrar-General, J. F. W. Tatham.

July 1.

The Prevention and Treatment of Cholera. S. M. Cox.
On a Substitute for Peptone and a Standard Nutrient Medium for Bacteriological Purposes. Report to the Medical Research Committee. S. W. Cole and H. Onslow.
Kala-azar in Soldiers Returning from Malta. G. R. Ward.

Medical Officer, London.

XVI. June 17.

Illegitimacy in Relation to Infant Mortality. T. W. Taylor Barlow.

June 24.

Meat Diet in Relation to Health.
The Maintenance of the Standard of Municipal Sanitation during the Continuance of War Conditions. James Wheatley.

July 1.

The Laboratory Diagnosis of Cancer. Harvey R Gaylord.

July 8.

Flies and Refuse Heaps. W. H. Symons.

Public Health, London.

XXIX. July.

The History of the Birth and Death Rates in England and Wales from 1570 to the Present Time. John Brownlee.
Some Points in Connection with Scarlet Fever. L. J. Milne.
Smells or Effluvia Considered from the Chemical, Physical and Physiological Points of View. M. Young.
Imported Egg Yolk and Other Egg Products Examined at the Wharves in the City of London. A Report to the Sanitary Committee of the Corporation of London by W. J. Howarth.

Tropical Diseases Bulletin, London.

7. June 30. Sanitation Number.

Disease Prevention: Malaria, Plague, Typhoid, Beriberi, Vaccination, Food, Water.
Sanitary Organization: Cause and Effect; the Sanitarian and Finance; Night Soil Conservancy and Education.
Sanitary Rulings: Protection of Milk in Four Indian Cities; the Uganda Township Ordinance; Factories.
Treatment of Waste: The Economics of Conservancy; the Economy of Waste.
Sanitary Works: Irrigation and Malaria; Influence of Anti-Malarial Works; Double Domestic Water Supplies; Floors; Irrigation and Drainage; Rural Water Supplies in the Tropics.